ANNUAL REPORT
OF
PROGRAM ACTIVITIES

CLINICAL CENTER

FISCAL YEAR 1971

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE NATIONAL INSTITUTES OF HEALTH

ANNUAL REPORT

OF

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CLINICAL CENTER

U.S. National Institutes of Health.

Fiscal Year 1971

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service National Institutes of Health

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CLINICAL CENTER DEPARTMENT REPORTS

Fiscal Year 1971

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3. Clinical Pathology Department
4. Department of Diagnostic Radiology
5. Employee Health Service Branch
6. Environmental Sanitation Control Department
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July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

ANESTHESIOLOGY DEPARTMENT

CC-23
Serial No.

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July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

ANESTHESIOLOGY DEPARTMENT

CC-23
Serial No.

GENERAL

The Anesthesiology Department of the Clinical is a professional service department. Its primary responsibility is the provision of anesthesia, inhalation therapy and related services for patients hospitalized at the Clinical Center. Our relatively small staff, made up of qualified physician anesthesiologists, nurse anesthetists, medical technicians, and secretarial personnel, averaged 19 persons during the year. Physician and nurse anesthetists administered anesthesia and gave related supportive treatment for patients having major operative surgery or diagnostic studies that required general anesthesia or close medical surveillance during procedures under local anesthesia. Inhalation therapy technicians were responsible for providing equipment and technical assistance for all forms of respiratory therapy utilizing medical gases, nebulized medications, and mechanical measures for respiratory support. Two of our staff anesthesiologists carried out research studies in connection with their clinical work, independently or in collaboration with Institute investigators, when time and appropriate patient subjects were available.

The number of Anesthesiology Department personnel on duty was categorized as follows, based on the yearly average:

Clinical and Research Anesthesiologists [1]	7.0
Nurse Anesthetists	3.0
Inhalation Therapy Technicians	4.5
Anesthesia Technicians [2]	3.0
Secretarial Personnel [3]	2.0

1. Two anesthesiologists engaged in part time research (5%-40%) which was associated with clinical duties in the operating rooms or Dental Clinic.

2. Three anesthesia technicians were administratively assigned to Surgical Nursing Service, CC, during the year. However 90 percent of their duties were related to anesthesia.

3. One secretary employed part time (3 days per week).

ANESTHESIOLOGICAL PROCEDURES PERFORMED

Anesthesia and related supportive treatment were provided for patients in 1205 instances. Surgical operations accounted for 1,019 and diagnostic procedures for 186. Miscellaneous services, consisting of nerve blocks, consultations, and resuscitation treatments totaled 151. Surgical and diagnostic procedures were, for the most part, extensive and prolonged. Many of the patients were seriously ill with life-threatening conditions, whose health and continued survival were dependent on the success of the surgery. Anesthesia time exceeded 3 hours in 556 instances (46 percent), 5 hours in 272 procedures (23 percent) and 6 hours in 187 operations (16 percent).

Surgical procedures classified according to type of surgery and the use of special adjunctive techniques were as follows:

1.	Thoracic (cardiac, pulmonary, great vessels, superficial chest)	
	a. with extracorporeal circulation technique	188
	b. closed technique	111
2.	Neurosurgical	
	a. craniotomy	83
	b. sterotaxic procedures, including thalamotomies	19
	c. spinal cord operations	19
	d. other	1

Total body hypothermia was not utilized during the year.

3.	General surgical (abdominal, pelvic and inguinal)	168
4.	Kidney operations, including bladder and adrenal gland	22
5.	Perineal* (gyn-47, genito-urinary-45, others-6)	98
6.	Face, head, and neck	141
7.	Eye, ear, nose, and throat	45
8.	Dental**	23
9.	Orthopedic	27
10.	Miscellaneous procedures	74
	Total	1019

*Perineal operations included diagnostic culdoscopy for study, photographing, and surgical biopsy of pelvic organs.

**Dental operations requiring anesthesia were decreased significantly down to 23 cases from last year's total of 129. This was due to changes in the long term physiological studies of ambulatory dental patients undergoing surgery with use of various types of anesthesia conducted by NIDR with our collaboration. Current studies use methods other than general anesthesia.

Procedures performed by the surgical branches of NCI, NHLI, and NINDS were characterized as follows:

1. NCI - extensive excision procedures for treatment of cancer, particularly of the head, neck and pelvic regions.

2. NHLI - operations on the heart and great vessels to correct congenital and acquired defects; 188 of these procedures ere done with the aid of extra-corporeal circulation technique. An additional 29 cardiac and great vessel procedures ere done by closed methods.

3. NINDS - neurosurgical procedures to localize and remove the epileptogenic foci and neoplastic tumores, sterotaxic techniques for treatment of abnormal movement and tonus syndromes; surgery for vascular malformations of spinal cord were included.

The complexity and duration of more than half of the surgical procedures required that more than one anesthetist be present during critical phases of the operations. The composite anesthetic procedure including the manipulation of anesthetic equipment, physiological monitoring apparatus, thermal devices, blood transfusion etc., made it advisable to have a second professional anesthetist, physician or nurse present when indicated.

Diagnostic studies done with the aid of general anesthesia totaled 186, a figure which fluctuates from year to year by as much as 20 percent. Fifty-eight of these studies consisted of cardiac catheterization procedures on small children. Heavy or "controlled sedation" rather than full general anesthesia was utilized in the management of these children.

Patients with incapacitating illnesses capable of causing serious circulatory and respiratory derangements, underwent diagnostic studies under the care of anesthesiologists who maintained surveillance for vital signs and gave supportive treatment as needed.

Diagnostic tests done under general anesthesia included:

Pneumoencephalograms	15
Cerebral arteriography	12
Special eye examinations	1
Cardiac catheterization procedures	58
Cystoscopy	26
Miscellaneous, including cardioversions	74

The Institutes responsible for the admission of surgical patients who received anesthesia are listed as follows: the first six Institutes have surgical services.

Institute	Procedures	Percent
NCI	413	34%
NHLI	408	34%
NINDS	190	17%
NINDR	14	1%
NEI	25	2%
NICHD	20	2%
NIAMD	70	5%
NIAID	43	3%
NIMH	22	2%

Surgical and diagnostic procedures on the above patients were carried out by the six surgical services as follows:

Institute	Procedures	Percent
NCI	551	46%
NHLI	386	32%
NINDS	214	18%
NIDR	19	2%
NEI	23	2%
NICHD	12	.9%

INHALATION THERAPY ACTIVITIES

The Inhalation Therapy Section, Anesthesiology Department, CC, is staffed with four inhalation therapy technicians. One additional trainee position was filled during the second half of the year. This small staff was responsible for overseeing all inhalation therapy in the Clinical Center. The procurement and maintenance of adequate supplies of inhalation therapy equipment and its cleansing, processing, repair and sterilization occupied a large proportion of personnel time. Other duties consisted of daily rounds of patients receiving respiratory care, answering requests by attending physicians for initiation of new treatments and trouble shooting of equipment in use.

Staff anesthesiologists serve as medical consultants for the inhalation therapy technicians and for attending physicians who requested such service.

The types of respiratory care carried out by inhalation therapists have been roughly classified in the categories listed below with the numbers of hours or treatments given for each.

Oxygen therapy (tent, mask, catheter)	33,761 hours
Humid atmosphere therapy	52,716 hours
Aerosol therapy	4,556 hours
Intermittent positive pressure breathing with aerosols	52,797 treatments
Long-term respiratory assistance	19,865 hours
Short-term resuscitation and assisted respiration	19,805 hours

Educational Activities

Three types of regularly scheduled training programs for the instruction of Clinical Center personnel were held during the year as follows:

1. Staff anesthesiologists conducted monthly teaching and demonstration sessions of advanced techniques for cardiopulmonary resuscitation. Each participant was given an opportunity to demonstrate cardiopulmonary resuscitation techniques on a manikin. One hundred and twenty-four professional nurses, newly employed by the Nursing Department, received this instruction.

2. The Chief Inhalation Therapist conducted monthly orientation and demonstration sessions in the use of inhalation therapy equipment for 144 recently employed Clinical Center nursing personnel.

3. The Chief Inhalation Therapist also held monthly teaching and demonstration sessions on the use of positive pressure respirators for professional nurses on patient care units where such therapy is commonly employed; 170 nursing personnel received this training.

Twenty-four Hour Coverage

With only four inhalation therapy technicians on duty it was possible to schedule regular coverage for only two working shifts on week days and one day shift on holidays and weekends. Because of the high level of activities during week days which required the full use of all available employees, weekends and holidays were covered almost entirely by overtime assignments.

An on-call roster was maintained to provide 24 hour coverage with four technicians rotating through the duty. In this way, the services of an inhalation therapist were made available anytime it was deemed necessary by the attending physicians or nurses. An average of 6 calls per month for a total of 72 for the year was recorded. In each instance it was necessary for the technician to report to the Clinical Center from his home at distances varying from 10 to 45 miles for emergency duty. Personal inconvenience and the expense of travel outside of regularly assigned working hours were incurred in this extra duty.

Inhalation Therapy Facilities

For the past two and one half years the Inhalation Therapy Section has been housed in four modules of laboratory space specially adapted for its functions. Facilities for cleansing, sterilization with ethylene oxide gas, and aeration are provided as well as a storeroom for readied equipment, repair shop and an office. The increasing use of disposable items of respiratory equipment has helped to reduce the processing work to some extent, but this small decrease was more than offset by the increased use of non-disposable respiratory units which require special attention.

Our physical facilities for handling inhalation therapy equipment elicited the admiration of many visitors.

RESEARCH ACTIVITIES

Clinical associates in anesthesiology are deferred during three years of speciality training before they report to NIH. The third year of this training is usually devoted to research.

As a service department of the Clinical Center, the Anesthesiology Department was able to provide some time and facilities for clinical associates who have sincere research interests. The types of projects which can be undertaken are considerably limited by the type of patients hospitalized in the Clinical Center and by the facilities available for laboratory research. During the past year we added chromatographic gas analysis equipment to the Anesthesia Research Laboratory in Building 10-A. This addition greatly improved the methods for determining gas concentrations of anesthetic gases and vapors which constitute part of the studies referred to below. The Surgery Branch, NCI, made available its tissue culture laboratory for one of the studies conducted by our staff.

Research projects carried out by our staff are summarized as follows:

1. Dr. Bruce F. Cullen began an investigation of the changes in cardiac output and other cardiovascular parameters as related to time in anesthetized patients. Patients undergoing surgical operations were maintained at constant aveolar concentrations of halothane with the anesthetic levels measured by gas chromotography, and with aveolar carbon dioxide levels maintained at constant levels. The study has not progressed far enough to reach definite conclusions. Project report is attached.

2. Dr. Bruce F. Cullen with the collaboration of Dr. Fred Sample and Dr. Paul Chretien, Surgery Branch, NCI, have undertaken a study of the effects of inhalation anesthetics on the immune response mechanism in human lympocytes. Human lymphocytes were cultured in an environment containing various inhalation anesthetics. The study has progressed through the in vitro stage. It will be extended by studying lymphocyte transformation in the blood of surgical patients under anesthesia including the effects of other anesthetics administered along with halothane, such as nitrous oxide. Project report is attached.

3. Dr. Jordan Miller was engaged as co-investigator in a study for evaluation of the release of prothcollagen proline hydroxolase (PPH) following anesthesia with halogenated hydrocarbons. Dr. Harry R. Keiser, Experimental Therapeutics Branch, NHLI, is the principal investigator. The study is attempting to evaluate various anesthetic agents as to their relative toxicity based on the release of PPH from the liver. Project report is attached.

MAJOR PROBLEMS ENCOUNTERED

Staff shortages were the chief problem encountered, as in previous years. Also of significance was an increasing problem in the procurement of equipment and supplies needed for patient care.

1. Staff Shortages

Anesthesiologists. Two permanent staff anesthesiologists and five clinical associates, with the aid of three professional nurse anesthetists, carried out the clinical work schedules. At times there were acute shortages of professional personnel due to staff absences and to the peaking of surgical schedules, a constant characteristic of the Clinical Center surgical programs. Our situation could be improved by increasing the number of permanent staff anesthesiologists particularly for carrying out research work. An increase does not seem to be possible due not only to limitations on hiring which have been in existence for several years, but more specifically, due to the lack of candidates who are willing to accept government employment on a permanent basis.

The problems of supplying anesthesia services for three separate surgical suites and a number of other locations as requested by the surgeons of four or more Institutes have been described in previous reports and will only be mentioned in passing.

Inhalation Therapy Technicians. During the past year it was adequately demonstrated that we are woefully understaffed in inhalation therapy personnel. The work load imposed by current methods of decontamination and sterilization of inhalation equipment is considerable. Increasing use was made of long term respirators and other pneumatic devices which require constant surveillance and adjustments. If we had adequate staff, we would be justified in keeping one inhalation therapist on duty exclusively in the 6-West intensive care unit that receives postoperative cardiac patients. The patient load in this area alone would warrant a full time technician on a twenty-four hour basis. Constant attention is also indicated for patients with cystic fibrosis and those with neuromuscular disease receiving long term respiratory support in other locations in the Clinical Center. We feel that optimum respiratory care cannot be provided with the small staff available in view of the types of respiratory disabilities in Clinical Center patients.

Trained inhalation therapy technicians are in short supply. Those with recognized training and experience are not attracted to government employment because of the lower salary scale. Therefore, the problem is twofold in that if we were allotted additional positions for inhalation therapy, we would expect to have great difficulty in recruitment. One trainee position was added during the latter half of the year in an effort to offer an opportunity for seleced Clinical Center employees to advance in other lines of work. This has been beneficial from the standpoint of helping with some of the processing of work. Trainees, unless they have an exceptional background of medical experience such as possessed by discharged medical corpsmen, are not the solution to our problem.

Anesthesia Technicians. The unavailability of technicians trained to handle anesthesia equipment has been an outstanding problem during the past year. Three former nursing assistants, who in the past had received special instruction to enable them to assist anesthetist personnel in workroom and operating room duties, were administratively transferred to the Surgical Nursing Service some eighteen months ago. At that time there was an understanding that these employees would continue to provide support services for the Anesthesiology Department. Due to a number of factors including dual allegiance and dual supervision, an inordinate amount of absences because of sick leave, and the natural tendency to take advantage of the situation by playing one service against the other, we were on many occasions, deprived of the responsible technical help which we require for safe operation of anesthesia equipment in scattered locations. Suggestions that additional nursing assistant personnel be uptrained to perform these duties were welcomed by us. However, the availability of candidates for this special training has been nil.

The only reasonable solution would be the restoration of technicians to the Anesthesiology Department to be under our direct control and supervision.

2. Procurement Difficulties

Delay in ordering and procurement of inhalation therapy and anesthesia supplies and equipment resulted in a number of problems during the year. The backlog of unprocessed orders in the NIH purchasing organization resulted in very long delays in securing much needed equipment for patient care, such as humidity producing devices and volume controlled ventilators. Delays in payment for delivered items were responsible for the refusal of suppliers to fill additional orders until they had been compensated. Similar problems were encountered in securing adequate supplies of medical gases and chemical disinfectants.

CHANGES AND IMPROVEMENTS

Improvements were made in the decontamination of reusable anesthesia equipment. In line with the increasing interest in the control and prevention of nosocomial infections, automatic equipment was developed to do away with the manual washing and immersion in chemical antiseptic solutions. During the year we added an automatic processing unit which provides for adequate decontamination of the rubber and plastic components of anesthesia inhalation circuits which cannot be sterilized by other means. This was a fortuitous change in that if coincided with our inability to secure anesthesia technician help on a regular basis.

FUTURE OBJECTIVES

Future objectives are concerned with insuring an uninterrupted supply of anesthesiologists for our department. In July of each year two or three clinical associates complete their two years service and leave to accept academic appointments at compensation rates at least double that at NIH, or enter into private practice with even more attractive financial considerations. The existence of the PHS CORD Program enables us to attract qualified candidates who will agree to serve at NIH for two years following

the period of three years deferment while they secure anesthesia training. Any changes in the Doctor's Draft Law which would tend to weaken the incentive to apply for CORD Deferments would seriously affect future staffing. A combination of more attractive compensation scales and increased opportunity for research will be required in tne future to attrach and retain anesthesiologists at NIH.

PUBLICATIONS

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Jackson, S. H., Epstein, R. A.: The metabolic effects of nonvolitile anesthetics on mamalian hepatome cells in vitro. Anesthesiology 34: 409-414, 1971

Longnecker, D. E., Stoelting, R. K., Morrow, A. G.: Cardiac and pheripheral vascular effects of d-tubocurarine in man. Anesth. Analg. (Cleveland) 49: 660-663, 1970

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Stoelting, R. K., Longnecker, D. E., Eger, E. I.: Minimal alveolar concentrations in man on awakening from methoxyflurane, halothane, ether and fluroxene anesthesia: MAC awake. Anesthesiology 33: 5-9, 1970

Stoelting, R. K.: Case report - halothane anesthesia following methoxyflurane-induced nephrotoxicity. Anesthesiology 33: 464-66, 1970

Stoelting, R. K.: Case report - acute pulmonary edema during anesthesia and operation in a healthy young patient. Anesthesiology 33: 366-369, 1970

Serial No. CC-23

1. Anesthesiology Dept., CC
2. Anesthesia Research Lab.
3. Bethesda, Maryland

PHS-NIH

Individual Project Report
July 1, 1970 through June 30, 1971

Project Title: Changes in Cardiac Output and other Cardiovascular Parameters with Time in Anesthetized patients.

Previous Serial Number: None

Principal Investigator: Bruce F. Cullen, M.D.

Other Investigators: None

Cooperating Units: None

Man Years:

Total	0.1
Professional:	0.1
Others:	0

Project Description:

Objective: To measure quantitatively changes in cardiac output in anesthetized patients, plotted against time.

Methods: Patients undergoing surgical operations have been maintained at constant alveolar concentrations of halothane in the anesthetic level, as measured by gas chromatography or infra-red halothane analysis. Alveolar carbon dioxide levels have been kept constant and serially measured by capnography. Arterial blood pressure and central venous pressure were transduced and recorded on a Gilson or other appropriate paper recorder. Cardiac output has been determined from the dye-dilution method measured on a cardiodensilometer.

Progress: Several surgical patients have been studied. A series of ten to fifteen patients is projected.

Major Findings: Too early in study for definite results.

Significance to Biomedical Research and Clinical Practice:	The accumulated data will present further understanding of cardiovascular function in the surgical anesthetized patient especially with respect to the length of time the patient is subjected to the total operative experience.
Proposed Course:	Accumulation of data will be obtained in a series of ten to fifteen patients.
Publication:	The completed paper will be submitted to Anesthesiology in 1972.

Serial No. CC-23
1. Anesthesiology Dept., CC
2. Anesthesia Research Lab.
3. Bethesda, Maryland

PHS-NIH

Individual Project Report
July 1, 1970 through June 30, 1971

Project Title: The Effects of Inhalation Anesthetics on the Immune Response Mechanism in Human Lymphocytes.

Previous Serial Number: None

Principal Investigator: Bruce F. Cullen, M.D.

Other Investigators: Frederick Sample, M.D.
Paul Chretien, M.D.

Cooperating Units: Surgery Branch, NCI

Man Years:

Total:	0.8
Professional:	0.8
Others:	0

Project Description:

Objective: To observe changes in human lymphocytes cultured in an environment containing various inhalation anesthetics. Initially, in vitro experiments will be undertaken with human lymphocytes cultured in a halothane environment. The ability of transformation in these cells will be observed. Later, it is proposed to examine lymphocyte transformation, using blood specimens from surgical patients being anesthetized but prior to start of operation. The effects of other anesthetics added to the cellular culture environment, especially nitrous oxide, is also being investigated.

Major Findings: None to date.

Significance to Biomedical Research and Clinical Practice:	It is expected that significant alterations in the capacity of lymphocytes to transform when cultured in the appropriate environment will be observed thereby pointing the way to further investigation in the relatively untapped field of the effects of anesthetics on the human immune response.
Proposed Course:	The methods for evaluating lymphocyte transformation have been reviewed and chosen. The neceaaary equipment has been set up. Preliminary investigations have been underway for three months.
Publication:	Anesthesiology, late in 1971 or early in 1972.

Serial No. CC-23
1. Anesthesiology Dept., CC
2. Anesthesia Research Lab.
3. Bethesda, Maryland

PHS-NIH

Individual Project Report
July 1, 1970 through June 30, 1971

Project Title:	Evaluation of the Release of Protocollagen Proline Hydroxylase (PPH) after Anesthesia with Halogenated Hydrocarbons
Previous Serial Number:	None
Principal Investigator:	H. Keiser
Other Investigators:	J. Miller
Cooperating Units:	Experimental Therapeutics Branch, NHLI
Man Years:	
Total:	0.4
Professional:	0.2
Others:	0.2
Project Description:	
Objective:	To evaluate various anesthetic agents as to their relative "toxicity" based on the release of PPH from the liver.
Methods:	Blood is obtained pre and postanesthesia exposure. PPH levels are measured in the blood samples.
Major Findings:	Preliminary results seem to show that methoxyflurane and halothane cause rises which fluroxene does not.
Significance to Biomedical Research and Clinical Practice:	It is hoped that these studies will provide clues to the nature and causation of pathologic lesion entities associated with halogenated anesthetic drugs.
Proposed Course:	Ethrane and Forane will be studied in animals. An attempt will be made to evaluate what other factors will either increase or decrease the "toxicity."

July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY OF ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

BLOOD BANK DEPARTMENT

CC-24
Serial No.

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PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

BLOOD BANK DEPARTMENT

CC-24
Serial No.

SUMMARY OF SERVICE AND DEVELOPMENTAL ACCOMPLISHMENTS

FY 1971 began on an optomistic note; there was definitive evidence that a great reduction could be made in the risk of transmitting hepatitis to our patients. Some of the methods were available to achieve the goal. We were convinced that if we could obtain greater control of our blood donor sources then we could seek out the potential carriers and transmitters of hepatitis.

The situation that had developed was so bad that over half of the adult patients undergoing open heart surgery could be expected to become ill with hepatitis. The reason for the existence of that situation at the Clinical Center was found in the workload story. In 1963 there were 18 full time staff members and 14,000 transfusions, and a survey by the Management Policy Branch showed the extraordinary personnel productivity (productive time) of 87%. By 1969, six years later, the number of transfusions was up over 50% to 22,000 and we had only 21 full time positions. The quality of the work had not suffered since we had made judicious scientific decisions that trimmed test procedures to the minimum for continued safety and potency. A complete new product and program had been introduced for routine clinical use, i.e. cryoprecipitated antihemophilic factor. However, in order to manage this increased workload, 51% of the blood and components was purchased from commercial sources and another 27% from the Red Cross. We had therefore bartered our control over the safety of the product, i.e. our control over the donor population, for quantity production. We were aware of the possible problem of safety, and began a series of studies which definitively demonstrated that at our hospital, and nationally, commercial blood was the most significant part of the hepatitis problem.

We capitalized on that evidence at the beginning of this year. An internal program led by Dr. Harvey Alter to eliminate commercial whole blood and red cells, and to test for the Hepatitis Associated Antigen cut the hepatitis attack rate from a high of 60% down to less than 10% in the multi-transfused cardiac surgery patients.

Success has had a somewhat hollow ring. We found ourselves with an almost impossible ceiling on full time personnel. This year saw 23,000 transfusions, as many as our previous peak of 1968. However, instead of buying prepackaged blood, we now also recruited, collected and processed donor blood for 28% of our needs rather than the 11% of 1968. This was accomplished only by continuing support from the administrative office of the Clinical Center which loaned us full time and part time help. The hepatitis purity goal is much closer. The safety and potency of the products we issue have been maintained. The balance remained close.

WORKLOAD COMPARISONS

An eight year gross picture is shown in Table I.

	Number of Transfusions			Donors	Positions
	Whole blood & red cells	Coagulation components	Total		
1964	6874	6553	13,517	2159	21
1965	7666	13030	20,925	2292	21
1966	7574	13509	21,068	2442	22
1967	6870	13376	20,962	2219	24
1968	6294	16834	23,991	2654	24
1969	6742	14886	21,989	2306	21
1970	7445	10249	17,814	3564	20
1971	7900	14650	22,800	5300	20

Notes:

Units transfused are the products from one pint of blood. Whole blood and red cells require much more bench laboratory work (serology) than do the coagulation components (platelets and antihemophilic concentrates). Components are prepared fresh, but can be batched. Some miscellaneous products are not included above. Donors are tallied as pint collections at the Clinical Center Blood Bank. A cash incentive program for regular volunteer donors who are paid $25 for every other pint donated was introduced in 1970 and fully implemented in 1971. Additional part time and intermittent employees have also been used since 1966. 1971 figures are extrapolated from a nine month base.

Significance of workload figures:

The figures in the table were chosen as most representative of overall workload. They would need extensive breakdown to reflect the work picture, the character of which has changed over the years along with the Institute programs. Some general conclusions from more detailed figures can be made:

a. The use of whole blood and packed red cells, which represented the major laboratory workload, increased. A large amount of the recent increase was in whole blood which at the present time is almost exclusively used on the surgical services.

b. There was an increasing demand for platelets. Whereas we supplied only 7,360 units last year, this year it was over 10,000. Much of this therapy as well as the transfusion of red cells was given to out patients.

c. The increase in number of donors bled at the Clinical Center was due to a three-pronged effort: (1) the computerization of donor files; (2) the employment of recruiting staff; and (3) the donor cash incentive. Regular donors began giving blood more often. Intensified recruiting, making use of automated data processing, brought many new donors into the program, and the number of people who were donors was 1,900. This represents almost 20% of NIH employees in the area, a gratifying figure as compared with the national average of 2% for donors in the same age group. In addition, these NIH donors gave an average of 2.8 times per year which is 50% better than the national average (the maximum allowable is five times per year).

A review was made by month of the percent of donors who were given the cash incentive. Every attempt was made always to collect blood from new donors with the view towards entering them in the system, hoping that 'once a donor always a donor'. Since of course new donors are not paid for their first donation, in some months only 28% of the donors were paid. In other months as many as 53% of the donors were paid. The peak months during which paid donors were over 50% of the total donors were November and December. Since these are the months in which there is always the largest national shortage of blood, this indicates the utility of the cash incentive mechanism for evening out the peaks and valleys which would otherwise work to the detriment of the patient care programs at the Clinical Center.

All of this was reflected in workload since obviously the work done by the middleman from whom we used to buy prepackaged, commercial blood was now done by Clinical Center staff. Those 3,000 extra units of blood collected here represent $75,000 not paid to a middleman. Of this, $50,000 was distributed to employees and another $10,000 was spent on disposable and expendable packaging and testing materials. The other $15,000 did not cover personnel and data processing costs. The program is therefore not presented as cost-cutting but more importantly as disease-cutting, i.e. the impressive reduction in posttransfusion hepatitis.

There is a specific point to be made from comparison of these figures. In the past, we were able to supply the patient care demands without staff increase by contracting out part of our workload (blood collection and processing). When some contracts were terminated, something else had to give. We aimed for more efficient scheduling of requests for blood needs and looked at our own internal procedures to determine their value to patients. When no additional space nor permanent personnel were available, we were forced to reduce non-patient care services, the most time consuming of which was plasmapheresis.

We were still exposing the patient population at the Clinical Center to some risk of disease transmission from commercial blood. Many of the coagulation components (platelets and antihemophilic cryoprecipitate) came from commercial sources because of the inability to obtain voluntary donors on Saturdays in the number necessary for support of thrombocytopenic patients.

DEVELOPMENTAL RESEARCH

Hepatitis

Much of the developmental research effort was devoted to posttransfusion hepatitis and in particular to studies on the Hepatitis Associated Antigen (Australia Antigen). The history of this unique and now practical method of detecting some hepatitis carriers goes back to our 1965 annual report which carried this paragraph:

"A joint study by Dr. Harvey J. Alter and Dr. Baruch S. Blumberg of NIAMD, uncovered a unique serum protein in high incidence in patients with leukemia. This abnormality, the Australia antigen, is not specific for the disease but is another item of background data on cancer."

In the intervening years, the background data have shown that the frequency of the antigen in cancer patients was mostly attributable to the frequency of transfusion in these patients. The original Australia antigen has since then earned the label of Hepatitis Associated Antigen. Dr. Alter has been most involved in this continuing research and its practical application.

The ongoing study in which Dr. Paul Schmidt has intensively surveyed patients undergoing open heart surgery for the past eight years for the development of posttransfusion hepatitis was applied to assess the effect of both the changes in donor source and the significance of Hepatitis Associated Antigen. Blood was first tested retrospectively for the presence of

this antigen. This study demonstrated clearly that the receipt of Hepatitis Associated Antigen positive blood significantly increased the risk of posttransfusion hepatitis. It also showed that the hepatitis which followed the transfusion of Hepatitis Associated Antigen positive blood was more severe than that following transfusion of Hepatitis Associated Antigen negative blood.

Early in 1970 the National Research Council published a statement which tended to discourage routine testing for Hepatitis Associated Antigen. The senior professional staff of the Clinical Center Blood Bank took issue with this statement in an article in The Lancet and stressed the importance of initiating testing as soon as possible. The National Research Council responded, revised its position and then it recommended that all blood in this country be tested for Hepatitis Associated Antigen prior to transfusion. Dr. Paul Holland and Dr. Alter started the test program at the Clinical Center in February of 1970. This test program became the national model for hospital work.

Analysis was begun on data from an ongoing study in which all blood was transfused pretested for Hepatitis Associated Antigen and solely from voluntary sources. The aim of this study was to determine why hepatitis still occurred even after both Hepatitis Associated Antigen positive blood and commercial blood were excluded. The possibilities relate to the sensitivity of tests and also to unrelated viruses such as Cytomegalovirus, Espetein-Barr Virus and the agent of Infectious Hepatitis.

Dr. Alter did a large amount of work on the sensitivity of Hepatitis Associated Antigen tests. His method of counter-electrophoresis was evaluated against a panel of 120 coded sera distributed for the National Research Council by the Center for Disease Control. His method proved better than all other high and low voltage electrophoretic methods, equaled complement fixation and surpassed hemaagglutination inhibition. We began using this method for routine hepatitis screening; we gave reagents, training and consultation to individuals and laboratories working with Hepatitis Associated Antigen tests so that efficient methods might become available nationally and in other countries.

Earlier work in this laboratory led to the development of a radioimmune assay for Hepatitis Associated Antigen by Dr. John Walsh. This assay, in which the antigen is radiolabelled is presently too complex for routine blood bank use. Dr. Alter and Dr. Holland are working to develop specific purified antibody to Hepatitis Associated Antigen by disassociating it from immune complexes, to radiolabel this specific antibody and so to develop a practicable radioimmune assay system. In conjunction with NIAID they also developed a radioimmune precipitin

test which is highly sensitive for the detection of anti-Hepatitis Associated Antigen. These studies were first reported in June of 1971 in the Journal of Immunology as an assessment of the clinical significance of anti-Hepatitis Associated Antigen in relation to the prevalence of non-clinical hepatitis using the battery of sera from the serial studies of past years. This highly sensitive method has already established the fact that 30% of an adult population has antibody to Hepatitis Associated Antigen. This showed that a large segment of the U.S. population has had mild hepatitis and suggested that the antigen was disseminated by non-parenteral routes. The Blood Bank begun surveillance studies of Clinical Center personnel in a study initiated by Dr. Thomas Chalmers and will also obtain samples from first and fourth year dental students to see if there is significant professional potential to Hepatitis Associated Antigen exposure and secondarily increased hepatitis risk for patients. The potential for non-parenteral Hepatitis Associated Antigen spread will also be investigated in relation to Hepatitis Associated Antigen positive hepatitis in non-transfused leukemic children residing on a single Clinical Center Ward.

In addition to their work with the National Research Council, the senior professional personnel of the Department worked with hepatitis extensively in other ways on the national scene. Dr. Schmidt organized the Scientific session at the meeting of the American Association of Blood Banks at which the data and National Research Council recommendations were presented in such a manner as to ensure national acceptance. Dr. Holland discussed our experience in invited papers before the International Society of Blood Transfusion in Munich, the NAMRU-3/U.A.R. Symposium on Viral Hepatitis in Cairo, and the American Society of Clinical Pathologists. Dr. Alter also addressed several professional groups and all three physicians participated in discussions, workshops, and implementation planning for scientific societies, universities and the Veterans Administration, the Center for Disease Control and the Department of Defense on the importance of the Hepatitis Associated Antigen.

OTHER HEPATITIS STUDIES INCLUDED:

1. Investigation of Hepatitis Associated Antigen subtypes and the preparation of specific antisera to each of these subtypes in cooperation with Dr. Purcell of NIAID and Dr. J. Gerin of the Molecular Anatomy Branch of AEC.

2. Study of chronic hepatitis in relation to Hepatitis Associated Antigen complexes in association with Dr. P. Plotz, NIAMD.

3. Study of cellular immunity by Dr. Geoffrey Sherwood in patients recovering from Hepatitis Associated Antigen positive hepatitis and in chronic carriers.

4. Development of chimpanzee animal model for Hepatitis Associated Antigen hepatitis with Dr. Purcell, NIAID.

5. Establishment of liver cell tissue culture, subsequent chromium labelling of these cells and measurement of chromium elution following exposure of these cells to Hepatitis Associated Antigen, anti-Hepatitis Associated Antigen and Hepatitis Associated Antigen immune complexes in cooperation with NIAID.

6. In work on other serum proteins serendipitously found in hepatitis surveillance studies, Drs. Alter and Holland demonstrated the presence of antibodies to ruminant antigens in 0.1% of a "normal" donor population. These antibodies were 7S (IgG) immunoglobulins and were directed against at least three ruminant antigens one of which appeared to be IgG. The incidence of these antibodies is in part associated with deficiency of IgA (the major immunoglobulin found in gastrointestinal secretions) and suggested that the secretory IgA system protects against exposure to certain food antigens. Of immediate practical importance is that the presence of such antibody may give a false positive test for Hepatitis Associated Antigen under certain conditions of testing.

7. Localization of Hepatitis Associated Antigen in blood fractions in cooperation with Dr. J. Sgouris, Michigan State Department of Health.

B. TRANSFUSION SERVICES

Mrs. Mary McGinniss, Dr. Dennis Goldfinger and Dr. Geoffrey Sherwood were all active in the cooperative bone marrow transplant team, NCI. The methodology for recognizing and quantitating a successful transplant (graft) has several times been dependent on separating graft from host red cell production. Mrs. McGinniss has performed this work with the team. In addition, she has demonstrated that anti-penicillin antibodies caused some of the adverse reactions to grafts. This has permitted several donors to be used who would otherwise have been ruled out because of severe, but now identifiable, compatability problems.

Dr. Goldfinger and Dr. Sherwood, Clinical Associates, participated directly in daily patient care activities with Institute physicians. The specific problems of massive transfusion, intravascular coagulation, oxygenation of donor blood in re-

lation to storage time, and removal of white cells as a prelude to transplantation all presented opportunities for acquisition of knowledge during the process of supplying research quality quality patient care.

Because of the unique transfusion facilities here, a large number of transfusion problems are referred to our laboratory facilities. Often these are significant clinical problems and this then becomes a referral mechanism for patients with abnormalities of interest to the Institutes. The largest of these studies this year was the isolation of an unique immunoglobulin deficiency in a South Carolina serum. This was the basis for clinical study of a large kindred, many of whom were seen as patients by Dr. Holland at the Clinical Center in colloboration with Dr. T. Waldmann, NCI.

Dr. Alter and Mrs. Elsie Yanchulis worked with Dr. J. MacLowry of the Clinical Pathology Department and with the Center for Disease Control in isolating the source of blood poisoning due to Salmonella in six intensively treated, and multiply transfused, NCI patients. A series of microbiological studies and a record search of thousands of transfusions pinpointed several suspect donors from our commercial source of platelets. One of those donors was then proved to be an asymptomatic carrier of Salmonella with bacteria in his blood. Although the story reads like a classic medical detective novel, it was really only solved when the donor was admitted as a patient of interest to Dr. Root of NIAID. That donor had osteomyelitis of his leg. Again, as with hepatitis, we found hazard in commercial blood.

Mrs. Yanchulis and Mrs. Mary Ann Gralnick developed a method for improving 'priming' systems in the new types of bench model centrifuges being produced commercially for use in immunohematology. This time saving idea was forwarded as a formal suggestion.

AGREEMENTS WITH OTHER BLOOD BANKS

The Washington Regional Center of the American National Red Cross notified us that they wished to withdraw their "memorandum of understanding" under which donors giving blood here were credited as Red Cross donors. The reason given was that the Red Cross became obligated for blood coverage to the NIH employee group although it never saw the blood, i.e. blood collected here from employees was transfused here to Institute patients. The logic that this blood was blood that the Red Cross did not need to transship to the Clinical Center for patients with Red Cross credit was not accepted. Dr. Thomas Chalmers and Dr. Schmidt negotiated a compromise under which the Clinical Center would collect for the Red Cross and ship

fresh blood to the total of 20% of the NIH Employees strength annually (2,400 units of blood). The Red Cross unilaterally withdrew from that compromise agreement. As a result all coverage for NIH Employee is now offered directly by the Clinical Center Blood Bank through the National Clearinghouse of the American Association of Blood Banks. Our processing methods and procedures were inspected by the DBS to standardize our products with those shipped across state lines in barter by non-governmental blood banks. Meanwhile we continued to supply hospitals in the community with "emergency" supplies of blood and components that they cannot obtain from the Washington Regional Red Cross. This commitment amounted to over 1000 units a year.

PROFESSIONAL ACTIVITIES

In addition to major activities listed above, there were other examples of the significance in clinical research and patient care of this Clinical Center activity on the local, national and international scene:

Dr. Schmidt was made Secretary General of the International Transfusion Congress to be held in Washington in 1972. As a member of the Council on Immunohematolgoy of the American Society of Clinical Pathologists he directed a workshop on immunohematology at their annual meeting and also a three day tutorial on Blood Component Therapy given here. He was assisted in both of these by several members of the Department and other NIH staff.

Drs. Schmidt, Holland, Alter and Sherwood all were appointed or reappointed to the faculties of the local medical schools and participated in those teaching efforts as well as in the Clinical Elective Program for Medical Students at NIH.

Mrs. McGinniss served on the Committee on Education of the American Association of Blood Banks and together with Dr. Holland taught a course on Immunohematology in the Graduate Program of the Foundation for Advanced Education in the Sciences, Inc. Dr. Holland and Mrs. Mary Ann Gralnick were members of the Technical Committee of the American Association of Blood Banks; Dr. Schmidt of the Standards Committee and Scientific Program Committee.

Mrs. Gralnick was elected President of the Washington Blood Study Group, an association of technologists from the Washington-Baltimore area. She and Mrs. McGinniss directed a round-table discussion for the American Society of Clinical Pathologists on laboratory practices in transfusion.

Mrs. Wanda Chappell, Mrs. McGinniss and Mrs. Gralnick offered supportive technical assistance on an informal basis on dozens of occasions to immediate problems in patient-care therapy in the community.

In addition to a large number of formal and informal teaching activities for physicians, technologists, nurses and aides, formal training for Certification in Blood Banking was continued for graduate medical technologists in our program which is approved by the American Society of Clinical Pathologists. Four technologists were students in the 18 month program.

Dr. Goldfinger completed his two year assignment to this Department on June 30, 1971. He will report to the Clinical Pathology Department for formal residency training. It is planned to replace Dr. Goldfinger with Dr. Robert Moncrieff who has compieted four years of residency training in pathology at Loma Linda

Mr. Rodney Douglass joined the staff as Community Relations Specialist, specifically to manage the donor recruitment program, personnel and computerized files.

FUTURE COURSE

With the success of the large effort which proved so effective in reducing posttransfusion hepatitis at the Clinical Center, there has been a honing down on specific items of interest in the disease. An analysis of posttransfusion hepatitis when commercial and volunteer donors are from the same source city is underway. The disease is being studied in certain long-term carriers of the Hepatitis Associated Antigen to answer the question of the connection between covert acute hepatitis and late liver failure (cirrhosis). The intensive plan of last year to study the production and clinical significance of the Hepatitis Associated Antigen will be extended to a study of the corresponding antibody. There is of course an overriding interest in extending the large gains with the Hepatitis Associated Antigen to the many cases of hepatitis which show neither this antigen nor its antibody.

The donor program will be extended to include more active donors with care not to exceed the capacity workload Several adjustments in the computerized donor files will be made.

Trials are planned of frozen red blood cells in routine use and a assessment of several blood component fractions which have been developed for clinical use.

Continued refinement is planned of existing techniques in immunohematology to ensure the safety, purity and potency of transfusion at the Clinical Center.

Expansion of plasmapheresis activities is planned to provide a professional service to Institute physicians engaged in the therapy of cancer and other blood abnormalities.

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PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

CLINICAL PATHOLOGY DEPARTMENT

CC-63
Serial No.

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July 1, 1970, through June 30, 1971

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INTRODUCTION

The Clinical Pathology Department, as well as the NIH community, was greatly saddened by the death of Dr. Ernest Cotlove in September 1970. The loss of this very gentle man and respected member of the scientific community cast a shadow on the department's activity for this year. The absence of his patience, critical judgment, clinical expertise and human kindness have left a void in our activities which has spread beyond departmental boundaries. Those of us who had the privilege of association with Dr. Cotlove understand in some measure the magnitude of his loss both to his family and to medical science.

It should be noted that the Department is very grateful for the very considerable help which has been made so readily available from the Office of the Director, Clinical Center. Specifically, the patient expertise of Dr. Roger L. Black, Miss Margaret A. Badger, Mr. L. Earl Laurence and Dr. Thomas C. Chalmers was greatly appreciated.

During FY 1971 the goal of providing high quality laboratory services to Clinical Center patients continued to be increasingly difficult to sustain as the workload increased and technical staff positions remained constant or decreased. The educational function of the department in training resident physicians which was curtailed this year because of lack of positions, will be reinstituted next year at the expense of decreasing departmental research efforts. Since this department has long been one of the leaders for training physicians in laboratory medicine and the delivery of laboratory patient care services, it was felt appropriate to resume this critical teaching role. This action is taken with the full realization of the increased burden it places on the laboratory and senior staff, but it is felt to be completely consonant with national priorities in the health care field.

SUMMARY OF ACHIEVEMENTS

Clinical Chemistry Service

Recent Progress

The change noticed last year in the character of the workload toward that of an acute general hospital continued. The increased load came at a time when the available technical staff was reduced and imposed a severe burden on the resources of the Service. It was impossible to implement many desirable changes, but important steps were made toward providing additional necessary services for first-class patient care.

At the beginning of the year in-house coverage 7 days a week, 24 hours a day was introduced for the Clinical Chemistry and Hematology Services. The laboratory is now staffed for emergency tests by medical students from local universities outside the normal working hours. An intensive 10-week training period was given to each of the eight students to make them proficient in all the frequently requested emergency procedures. This coverage eliminated the need for regular day-time staff to undertake laboratory work at night except to serve in a back-up capacity from their homes if needed. This service was of considerable value especially in the post-operative management of patients who had recent cardiac surgery.

The introduction of an early ward report of patient data assisted patient-care physicians by making results on the most important clinical tests available in the early afternoon. The early ward report assisted the laboratory staff by reducing the number of inquiries concerning the availability of results on blood drawn earlier in the day. All results from the laboratory tests performed on instruments coupled on-line to the computer were usually available for the early reports in addition to several tests that were performed off-line.

The introduction of a new generation of console-terminals with a small laboratory computer improved considerably the overall reliability of the data entry to the CDC 3200 computer. These units enabled the special serial request card to be eliminated and at the same time permitted a greater range of comments relating to specimens to be used. The system was also available for data acquisition on weekends thereby reducing pressure on the laboratory staff at the start of each workweek. An additional console enabled urine sample weights to be transmitted to the CDC 3200 computer directly. Programs are now available to convert the weight of the specimen to an appropriate volume and to print on the daily reports the absolute quantity of materials excreted in addition to the concentration.

With the introduction of computer programs for processing data from the Enzyme Assay System (EAS) we were able, on some occasions, to include on-line enzyme results in the daily report. The large number of enzyme tests requested compelled the use of manual procedures every day for some tests. Unfortunately, on many occasions the EAS could not be used on-line because of increasing hardware problems and results had to be calculated by technologists or performed entirely by hand with considerable delays in the reporting of results and reduced availability of technical staff to perform other essential tests.

The printing of the previous value obtained from the same patient for each test on the work sheets and check lists proved of great value in assurance of accurate data. The technical staff is no longer solely dependent on the apparent correctness of a set of results within a day but can refer back to previous data.

During the year PBI determinations were discontinued by the Service in view of their relative non-specificity and the amount of work involved in doing these tests when the more specific T_3 and T_4 determinations were already available. Immunoelectrophoresis of plasma proteins was offered on an unrestricted basis. A mechanized procedure for cholesterol was introduced which had considerably

better reproducibility than the former manual procedure. A fluorometric procedure for triglyceride determinations was introduced at the same time. All abnormal triglyceride results were routinely reported although the test may not have been requested. Mechanized specific procedures for the time-consuming pyruvate and lactate determinations were also introduced into the routine service laboratory.

A more specific procedure was introduced for measuring the concentration of glucose in urine samples. Efforts to develop chemical methods which avoid interference from chemotherapeutic agents for several tests were continued. A preliminary survey was undertaken to determine the extent of drug interference with laboratory procedures and steps were initiated to develop a computer program to list interferences so that apparently abnormal results caused by the presence of drugs only and not by disease might be identified.

In spite of the greatly increased workload the laboratory continued to perform well in the various national surveys of laboratory performance. It is distressing that more tests had to be sent to outside laboratories, because in several cases the quality of work was not as good as that performed in-house. The Clinical Chemistry Service staff continued to provide extensive consultative help for investigators throughout the National Institutes of Health on the automation of laboratory procedures.

Training

Fewer Senior Staff within the Service necessitated a reduction in the time spent on continuing education of the technical staff. The lack of a Resident Physician in the Clinical Cehmistry Service for most of the year prompted the delegation of many of his duties to several technical staff members. The unanticipated laboratory problems led to considerable informal teaching on an individual basis.

The staff took advantage of the training courses offered by several companies to learn the operation of new instruments in the manufacturers' plants.

Research and Development

Dr. Nathan Gochman developed mechanized procedures for pyruvate and lactate and also modified procedures for cholesterol and triglycerides. All of these methods are now in routine use. Dr. Gochman initiated development of a specific procedure for uric acid which eliminates interferences from all major serum constituents and drugs, and development of procedures for the standardization of instrumentation terminology and operating procedures. With Dr. Young he developed a program for ensuring the optimum performance of continuous-flow analyzers.

Dr. Donald Young continued his evaluation of the prototype high resolution chromatographic systems developed by Dr. C. D. Scott and J. E. Mrochek at Oak Ridge National Laboratory. With Dr. J. E. Seegmiller (University of California, San Diego) and Dr. Mary Coleman (D. C. Childrens' Hospital) he is examining the metabolic cycles of autistic children. With Dr. Peter Goldman

(NIAMD) Dr. Young is determining the effect of diet on blood and urinary constituents and with Dr. E. K. Harris (DCRT) he is examining other variables that affect blood constituents. Dr. Young collaborated with Dr. J. I. Peterson (BEIB) in the development of a unique system for preservation of urine samples.

Dr. Nathan Gochman, Mr. L. T. Byrd and Dr. Donald Young continued their collaboration with Dr. Robert Schaffer and Paul Cali of the National Bureau of Standards on the development of referee methods for clinical laboratories.

Mr. Hiroshi Nishi continued his development of a mechanized pediatric analytical system with several engineers of BEIB. The system is capable of making accurate glucose analyses on 1 µl serum and procedures have been developed for accurate analysis of the following constituents on 10 µl serum or less-- urea nitrogen, LDH, GOT, GPT, phosphate, total protein and albumin.

Staff Appointments

Dr. Nathan Gochman was appointed Assistant Chief, Clinical Chemistry Service.

Dr. David Thomas joined the staff as a Visiting Associate in May 1971.

Future Plans

Our increasing awareness of the problem of interference of chemotherapeutic agents with laboratory tests caused us to reevaluate many chemical methods. Many of the traditional chemical diagnostic procedures are inadequate for measurement of serum constituents, particularly in an environment such as the Clinical Center in which new and investigational drugs are administered frequently. The evaluation of new methods is laborious yet we intend to reassess most of the methods used to determine major constituents. The use of highly specific enzymatic procedures is desirable to eliminate interferences, yet in many instances new drugs tend to have a structure similar to the analyte normally measured by a so-called specific procedure. Development of a system whereby the Chemistry Service will be notified of the drugs being administered to patients in at least one ward will enable us to evaluate the practical applications of a hospital-wide alerting routine to report potential drug interference.

With the development of the instrumentation for mechanization of pediatric analyses we intend to employ the system for emergency analyses also, thereby eliminating some of the differences that may arise when different methods and instruments are used to perform the same test. We hope to interface more AutoAnalyzers to the CDC 3200 computer to process the routine workload. With the steadily expanding workload this probably is the only means by which the quality of the work can be maintained using the present equipment. As new analytical instruments with similar or better precision become available we hope to update the present methods. Mechanization of those tests now performed by time-consuming manual procedures by one of the recently available commercial systems would permit us to provide a more rapid turn-around. It would also provide a means, comparable to that achieved with the Coulter Counter Model-S in Hematology, of making available to a physician in the out-patient area, the results of tests on his patient before the patient leaves the hospital.

The availability of a cathode-ray tube terminal will permit preliminary studies on the feasibility of interrogation of the computer to determine previous results on patients and the current status of work. This is discussed under Future Plans of the Research, Development and Laboratory Automation Section.

It is hoped that with Dr. David Thomas, a Visiting Associate from Australia, the Clinical Chemistry Service will be able to provide enhanced consultative services for management of problems of patient care. This service has been restricted throughout the past year due to shortage of staff. However, a further increase in workload will reduce one of the valuable contributions to patient care which can be made by consultation by the laboratory staff--that of performing special tests which are recommended by the consultant but which cannot be performed on a routine basis.

Work will continue on high resulution chromatographic systems that are now under evaluation and other separation procedures such as thin-layer chromatography and techniques for enzyme fractionation. It is apparent that many problems of interpretation of data arise because it is not normally possible to examine an entire metabolic cycle but only a single component of it. It is hoped that our intensive recent developmental efforts in detailed analysis of body fluids may be applied in a practical manner for the care of patients within the Clinical Center.

Hematology Service

Recent Progress

Considerable effort was expended to improve data acquisition and reporting sub-systems. This was accomplished by: (1) Interfacing the Model-S Coulter Counter to the computer thus allowing for direct transmittal of tests from the Model S to the computer without the potential clerical errors previously involved. (2) Implementing new consoles in the Hematology Service for all work including peripheral blood differentials. (3) Generating an early computer report of completed and uncompleted results which was sent to the floors as well as to the Hematology Laboratory to facilitate patient care dependent on early generation of hematology results.

The use of the Clin-Data system as a stand-alone in the laboratory met with unexpected delays and integration of this system with the Clinical Pathology computer has not been completed.

The Hematology Laboratory on the first floor underwent major revision to incorporate adequate air-conditioning for the proper functioning of a variety of electronic and computer data equipment in the Laboratory. During this time much of the laboratory space was not available for routine use. In spite of the many hardships this imposed, the laboratory service continued under an increased work load. The Hematology Service was able to continue to present the data to the physicians each day on time and the patience and forebearance of the patients, laboratory staff and referring physicians made this possible.

Training

The Clinical Pathology residents assigned to the Hematology Service spent much of FY 1971 participating in consultative services to all the Institutes. In addition specific rounds were conducted jointly with the National Cancer Institute. Residents as well as the rest of the staff of the Hematology Service played a major role in the third and fourth year student elective in Hematology by conducting two to four week training periods for each Hematology trainee. This has included bone marrow interpretation, introduction to the laboratory, introduction to coagulation, and participation in patient consultative services. This endeavor on the Hematology staff's part has contributed to the early success of the third and fourth year student trainee program in Hematology.

Dr. Harvey Gralnick taught a course in Hematology, Medicine 12, FAES. He presented the basic pathophysiology and mechanisms of hematologic disease to a group of physicians, Ph.D.'s and medical technologists from the Washington area. Dr. Gralnick has been working as a member of the Committee of Education of the American Society of Hematology on four films which will be used as educational devices to teach coagulation to physicians and medical students.

The Hematology Service was involved with the training of technologists and individual physicians from surrounding community hospitals in setting up their own coagulation laboratories.

Research and Development

The majority of time spent on research was directed towards a greater understanding of coagulation abnormalities in the patients seen at the National Institutes of Health.

Dr. Harry Givelber and Dr. Harvey Gralnick implemented I^{125} fibrinogen turnover studies for investigation of hyper and hypo-coagulable states. During this time, it became apparent that in acute leukemia a rapid turnover of fibrinogen appears to be part of the disease process and may in itself or with other complications result in a hyper-coagulable state. In addition patients receiving L-asparaginase who received I^{125} fibrinogen demonstrated a normal fibrinogen turnover compared to pretreatment values indicating that in part the hypofibrinogen anemia of L-asparaginase is related to decreased synthesis.

Dr. Gralnick and Dr. Givelber studied three additional patients with abnormal fibrinogens. One patient showed a new family called Fibrinogen Bethesda II, and had a familial dysfibrinogemia anemia. The second individual was a patient with a carcinoma of the breast who had an acquired abnormal fibrinogen and the third individual was one with acute leukemia who developed an abnormal fibrinogen during a period of relapse.

Dr. Emanuel Abrams worked in conjunction with the National Institute of Allergy and Infectious Disease to study the effects of endotoxin on human coagulation. Heretofore the studies had been done primarily in animals with relatively few studies being performed in humans. These studies promise a greater understanding of the hemostatic disorders associated with endotoxin shock and gram negative septicemia.

Dr. Abrams in conjunction with Dr. Gralnick studied the properties of fetal fibrinogen. Fetal fibrinogen is thought to differ from human fibrinogen perhaps in the same way fetal hemoglobin differs from adult hemoglobin.

Dr. Andrew Horvath worked on normal and abnormal cross-linking of human fibrinogen in acrylamide gel electrophoresis. In addition, Dr. Horvath instituted a study of the effects of heparin on experimental leukemia in L-1210 mice, trying to determine if prophylactic heparinization will benefit the mice from the untoward effects of acute leukemia by reducing the hypercoagulable state which we have previously demonstrated in a human leukemia.

Dr. Henry Tan has been investigating the electron micoscopic findings in acute promyelocytic leukemia. We hope that Dr. Tan's work on the differentiation of various types of promyelocytes and some of their physiological properties will enable the physicians to better understand the pathophysiology of acute promyelocytic leukemia and possibly enable them to utilize more effective measures of therapy.

Dr. Emanuel Abrams has been working with the Technicon Auto-counter, an automated piece of equipment which automatically counts platelets in whole blood and in fingersticks. Dr. Abrams' evaluation of this machinery will enable our department to ascertain whether it fulfills the necessary requirements of accuracy and precision for routine use.

Drs. Abrams, Givelber and Gralnick began evaluating the Hemo-log, an automated piece of equipment which can process simultaneously the hematocrit, hemoglobin, red blood count, white blood count, platelet count, MCV, MCH, MCHC, prothrombin time and partial thromboplastin time. Needless to say, either or both of these two new instruments could help reduce the increased workload with which the laboratory has been burdened over the past three years.

Dr. Sally Marchesi continued her work on the isolation of human Factor VIII from human plasma. In conjunction with Dr. Gralnick she worked on the immunological activity of Factor VIII using an antibody produced in goats against human Factor VIII and an antibody produced in rabbits against a more pure Factor VIII. Studies were initiated to ascertain the presence or absence of immunologic activity of Factor VIII in hemophilia and von-Willebrand's disease. In addition, a complement fixation assay is being developed to test for immunologic presence of Factor VIII. Dr. Marchesi and Dr. Gralnick, in collaboration with Drs. Decker and Steinberg, NIAMD, are evaluating the presence of fibrinogen degradation products in the urine of patients with systemic lupus erythematosus in order to develop a sensitive and accurate assay for the presence or absence of active renal disease in lupus erythematosus. In addition this assay is being used to determine the presence or absence of fibrinogen degradation products in other patients with renal disease. We hope this might provide greater understanding of the pathophysiology of this disease. Such a development suggests the possible use of anticoagulants as a therapeutic modality to improve renal function.

Dr. Philip Greipp worked on the association of positive direct Coombs test in patients receiving sodium cephalothin with abnormalities in metabolic behavior

of red cells particularly related to the osmotic fragility. In addition, Dr. Greipp is working on the immunoglobulin present in a patient with vasculitis which has the ability to agglutinate platelets in vitro and to enhance leukocyte phagocytosis of these platelets.

Staff Appointments and Changes

Dr. Harvey Gralnick was appointed Chief, Hematology Service, in September 1970. Dr. Harry Givelber was appointed Assistant Chief, Hematology Service, in July 1970.

Future Plans

Considerable effort will continue to be devoted to evaluation of new instrumentation in Hematology to find new techniques for the automated performance of hematology procedures. This will be done with the following objectives in mind: (1) to use in developmental work, (2) to improve the caliber of hematology data generated and (3) to allow the Hematology Service to accept a greater burden of laboratory work of the patients in the National Institutes of Health. Hopefully the computer in the Clinical Pathology Department will play an expanded role in monitoring laboratory data. It is planned to have the Clin-Data System function as a "stand alone" system which will allow it greater freedom in generating results by reducing the dependency on the central computer.

Continued emphasis will be placed on the investigative procedures in human Factor VIII and normal and abnormal fibrinogen metabolism including the subunit structure of normal and abnormal hemastasis. Further ultrastructural studies to elucidate abnormalities and related mechanisms to disease in acute leukemia will also be emphasized. In addition, it is hoped that the Hematology Service will be able to continue its training program for both 3rd and 4th year medical students as well as clinical associates in both the Clinical Center and other institutes and for senior physicians who would wish to rotate through the Hematology Service.

Microbiology Service

The data processing request cards for microbiology and serology were designed, modified and tested, and require further revision before they can be printed in final form. Their use in FY 1971 was not realized as anticipated. This will be discussed more fully under Recent Progress.

The prototype instrument designed by BEIB to read the microtechnique antibiotic sensitivity plates was not sufficiently evaluated because of lack of personnel. It remains in the evaluation stage and will be discussed under Recent Progress.

The development of techniques for use of micro volumes of media for identification of the Enterobacteriaceae by Dr. Daniel Bruce was postponed because of lack of personnel and Dr. Bruce's new responsibilities in the area of data processing. Likewise, Dr. Bruce's attempts to isolate the active pigment-producing factor in Cryptococcus neoformans have been abandoned for lack of time.

The attempts to evaluate radioactive techniques for early detection of positive blood cultures and sterile fluid, on contract was never started because of lack of available funding. The in-house evaluation will be discussed under Research and Development.

The attempts to detect significant bacteriuria by measuring the amount of bacterial ATP present in the urine were hampered by lack of personnel and by equipment failures.

Recent Progress

During FY 1971, the service continued a very active and rewarding relationship with the Laboratory of Clinical Investigation, NIAID, by attendance and participation in their conferences and consultation rounds. These rounds included problem cases from both the NIH and the Bethesda Naval Hospital. The requests for antibiotic levels continued to increase and the combinations of drugs used created challenging problems in separating the effects of different antibiotics in the same serum.

The level at which serial dilution antibiotic sensitivity tests were performed stabilized between 7,500 - 10,000 a month. Technologists from other hospitals continued to visit the laboratory to learn this technique.

In terms of data processing, evaluation of request cards continued and it was decided that they should be ready for use by January 1972. These cards will be used with the CDC 3200 computer to generate work lists and report forms which contain only patient identification data. The decision was made that the final reports would not be generated by the computer, but will continue to be produced by our secretaries on a special input terminal. This will obviate the necessity of very sophisticated programming. The programming for this system is almost complete and we hope that it can be sufficiently debugged for use by January 1972. All of this work is being done in-house.

Work on the automatic microtiter plate reader was postponed for most of the Fiscal Year 1971 because of lack of a software program to permit the computer to interpret the results. Dr. Richard Friedman recently wrote such a program which is in the early stages of evaluation. This will represent an on-going project to see if this part of the microtechnique can be automated. Some technical problems occurred with the reading instrument but we hope that these can be solved.

Virtually all of the media used in the laboratory was prepared by the Media and Glassware Section, DRS. This represented a greatly increased load on the Media Section, but provided the laboratory with a fresh, well-controlled supply of media. Studies are continually in progress to attempt to simplify the culturing techniques and a number of newer media have been adopted.

Training

In 1970 only one resident rotated through the service. He participated in the departmental laboratory rounds and the consultation rounds with the NIAID and Bethesda Naval Hospital.

Weekly meetings were held with the laboratory technologists to discuss interesting patients, explain diagnostic and therapeutic procedures and discuss new laboratory procedures. On rare occasions, some technologists attended conferences here at the NIH, but usually the pressure of work precluded much of this type of educational experience.

Short meetings were held 2-3 times a week with each of the laboratory supervisors to keep them appraised of diagnostic problems in the hospital.

Technologists from other hospitals spent from 2-4 days at a time at irregular intervals during the year, learning the micro-titer techniques for antibiotic sensitivity testing.

Research and Development

The data processing system is discussed under Recent Progress and Research, Development and Laboratory Automation Section.

Some very limited in-house attempts were made to evaluate radioisotopic techniques of rapid detection of bacteria in blood and sterile fluids. Drs. MacLowry and Bruce put considerable effort into this technique which appeared theoretically very promising. They were unable to duplicate work that had been published previously and personal communication with two other groups similarly engaged revealed no success in this endeavor. It is hoped that more work will make this technique possible. Drs. MacLowry and Bruce, along with Mr. Mel Kronick, BEIB, have developed a new device for collecting and measuring radioactive gas and a patent was applied for. This capture vial is already being used by chemists in the NCI for studies of enzymatic reactions. An attempt to have these studies performed on a contract was dropped because of lack of funds.

The attempts to evaluate an instrument which measures bacterial ATP in the urine were severely hampered by lack of personnel. In addition, some electronic problems with the detection instrument slowed our efforts. This study will be continued as rapidly as possible.

A gas chromatographic technique was set up for identification of bacteria and is in its initial phase of evaluation. This procedure, if shown to be reproducible, will potentially be an additional aid in the identification of difficult organisms. There is considerable enthusiasm for this method by some writers, but time is needed to demonstrate its efficiency in the clinical laboratory.

A very new instrument which measures the light scattering of laser light in a solution which contains bacteria was evaluated. Although an ingenious application of light scattering principles, this instrument was not suitable for routine clinical use and was rejected. This instrument may in years to come be modified sufficiently for routine use, but presently it is much too cumbersome and we did not have enough time to work out its problems in great detail.

Dr. Charles Zierdt continued his studies on the intestinal protozoan Blastocystis hominis. His work established that this is a protozoan and not a yeast as previously described. Relatively little is known about this organism, but studies in its life cycle, ultrastructure and cultural characteristics are in progress. This parasite grows only in the presence of a supporting bacterial flora and is strictly anaerobic. Attempts have been made to grow it exenically (with no accompanying bacteria) and monoxenically (with one type of supporting bacteria). The disease-causing potential of this intestinal organism is only beginning to be appreciated.

Dr. Zierdt characterized physically, chemically and biologically, ten strains of the bacteriophage of the bacterium Corynebacterium acnes. A new viral inhibition phenomenon was elucidated and the data on resistance to physical effects, host range, multiplication techniques, serologic specificity, ultrastructure and plaqueing characteristics are almost completed.

Dr. Zierdt collaborated with Dr. Bruce Phillips, Laboratory of Microbial Immunity, NIAID, in attempts to infect germ free animals with Blastocystis hominis. Additional collaboration with Dr. Phillips contributed to our study of the enzyme histidine decarboxylase through work in which stomach tissue from germ-free animals was tested for the enzyme as well as tissue from germ-free animals in which lactobacilli had been established. The enzyme was lacking in germ-free rats but present in normal amounts in rats fed lactobacilli provided they had established the typical lactobacillus stomach "membrane".

Dr. Zierdt continued collaboration with Dr. M. A. Beaven and Dr. Z. Horakova of the Experimental Therapeutics Branch, NHLI. It was discovered that the enzyme histidine decarboxylase in rat stomach tissue, previously reported to be of mammalian origin, was actually of bacterial origin, being synthesized in a previously undescribed "membrane" lining the stomach wall. This "membrane" was composed entirely of Lactobacillus acidophilus.

Dr. Zierdt worked with Dr. T. Theodore of the Laboratory of Microbiology, NIAID, who developed a technique of acrylamide gel electrophoresis for study of bacterial L forms. Drs. Zierdt and Theodore characterized a group of bacterial L forms to establish the taxonomic position of this new group of microorganisms. These cell well deficient bacteria were isolated from infections in Clinical Center patients. Some of these infections were fatal.

Dr. Zierdt collaborated with Dr. Manley Mandel, M.D. Anderson Hospital, Houston, Texas, who determined the guaninecytosine base ratios for the desoxyribonucleic acid of the ten bacterial L form cultures that we isolated from infections in patients.

Miss Anne Jennings and Dr. John E. Bennett, NIAID, finished their studies on the taxonomy of the yeast-like fungus Rhodotorula and submitted their work for publication. This organism is generally thought to be non-pathogenic, but its isolation from patients with debilitating diseases suggests that it may on occasion be associated with significant morbidity.

Staff Appointments and Changes

Dr. Daniel Bruce was appointed Acting Chief, Research, Development and Laboratory Automation Section, September, 1970.

Dr. James MacLowry was appointed Acting Chief, Clinical Pathology Department, July, 1970.

Dr. Robert Hungate, President of the American Society for Microbiology and a world renowned microbiologist in the field of ruminant bacteriology spent six weeks in the laboratory sharing his anaerobic culture techniques and learning something of the problems in a clinical laboratory.

Dr. Vee C. Jay joined the laboratory in June 1971 as a Staff Fellow.

Future Plans

In the area of data processing it is hoped that by June 1972 the prepunched request card system with generation of work lists, blank report forms and special input on these report forms by the secretary will be completed. This means that a data bank of microbiological data will be accumulating. The microbiology reports can then be included in the discharge summaries and be available for retrieval purposes after appropriate software programs are written.

Continued studies on separation of various antibiotic combinations in serum, urine and other biological fluids will have a high priority.

Evaluation of gas chromatographic techniques for identification of unusual bacteria will be pursued.

Efforts will be made to evaluate new instruments that have the promise of aiding in more accurate and rapid identification of bacteria. Radioisotopes, bacterial ATP detection and more efficient light scattering techniques will be used.

Research, Development and Laboratory Automation Section

Recent Progress

Computer System

1) Additional Core Storage

An additional 16,000 words of core storage were added to our CDC 3200 computer increasing its total storage capacity to 32,000 words. The additional core provides improved flexibility in processing "foreground" programs during daily operation and now makes it possible to more effectively utilize the higher computer languages such as FORTRAN for routine Input-Output programs. Previous storage constraints had made it necessary to write most programs in the more basic COMPASS language which made the writing and modification of such programs much more difficult.

2) New 854 Disc Driver

Three Model 854 Disc Drives were installed to replace our older 853 Disc Drives. These new drives proved to be much more reliable than the previous model and added considerable Disc storage capacity to our system.

3) Conversion to "Beta" System

In July we changed from the "Alpha" to the "Beta" operating system. This system was designed by our contractors, Berkeley Scientific Laboratories, to take advantage of the experience gained during 7 years of operation with the "Alpha" system. It utilizes the MSOS executive program developed by Control Data Corporation and allows us to operate simultaneously in "Background" and "Foreground" mode. Thus, while data is being entered via the on-line equipment and consoles in "Background," we can simultaneously process this data, print reports, or run any other program in "Foreground" mode. The "Beta" System incorporates a unique file structure specifically designed for our data, and a number of processors which facilitate rapid handling of chemistry and hematology data. The system is designed to allow for incorporation of data from other laboratories (i.e., Microbiology). An additional advantage of the system is that it allows for correction of erroneous data after it has been processed and placed in the Active Patient File.

4) Development of Back-Up Systems

We were concerned about the capability to process data in the event of malfunction of any of the equipment. Towards improving this capability we have: (a) Installed improved tape units into both the Chemistry and Hematology Laboratories so that all data entered via consoles in these labs is captured on tape. In the event of malfunction in the CDC 3200 computer these tapes can be saved and the data entered into the computer at a later time, (b) Modified the Beta System so that in the event of malfunction in either the Chemistry or Hematology controller systems data from either laboratory can be entered via the system in the other laboratory, (c) Written a program which would generate reports on the printer in the Hematology Laboratory in the event of malfunction of our printing unit on the main computer. This program has not yet been fully tested under routine daily operation.

Chemistry Laboratory

1) More Tests On Line

At the start of the year only the sodium, potassium, CO_2, chloride, BUN and glucose tests in the Chemistry Laboratory were on line. The Enzyme Assay System (SGOT, SGPT and LDH) and the Urine Balance were added. However, while the computer interface and programs functioned satisfactorily with regard to the Enzyme Assay System, the machine itself (developed as a prototype by Airborne Instruments Laboratory) proved very unreliable and its use in daily operation was severely curtailed by frequent malfunction, and the entire

future of the system is now in doubt. With regard to the Urine Balance laboratory, logistics has similarly curtailed its use in daily operations.

2) New Data Entry Consoles

The BSL-GP-10 data entry consoles were replaced by Model GP-40 consoles. The GP-10's had proven extremely difficult to maintain with frequent mechanical breakdowns. The new consoles employ a more advanced circuitry with a minimum of electronic components in the consoles themselves with the major circuitry in a control system built around a PDP-8 computer. This facilitated maintenance and reduced down-time due to console malfunctions. The new data entry consoles are controlled by a modified Clin-Data system which utilizes a PDP-8 computer with peripheral communication devices. This Clin-Data system receives data from the remote data entry consoles and passes it on to the central CDC 3200 computer. It also adds to the potential of the system since some intermediate processing can be performed on the data before transmitting it to the central computer. Thus verification procedures and back-up data-capture functions are now possible and are planned for development in the future.

3) Improved Laboratory Check Lists

An improved check list was developed. The list carries the most recent previous result for the same test, in addition to the current day's results, enabling the laboratory to detect and investigate any apparent changes in a patient's status.

Hematology Laboratory

1) On Line Tests

The two Coulter Model-S blood analyzers which determine the RBC, WBC, Hct, Hgb, MCV, MCH, and MCHC were interfaced and added to the on-line system in the Hematology Laboratory. An on-line printer was installed and is now producing the control messages for that system. This printer will also be used to backup and supplement the main printer in the computer room.

Microbiology Service

Development of a system to service the routine operation of the Microbiology Service was initiated as an in-house effort and trial of the first phase of the system is scheduled for July 1971.

Two related research projects that were recently completed involved computer diagnosis of microorganisms based upon their biochemical characteristics. The first of these programs identified organisms of the family Enterobacteriaceae based upon the standard tests for enteric organisms and the second programs utilized antibiotic sensitivity patterns to identify organisms.

Clinical Pathology Department - General

1) Early Ward Reports

The laboratories worked under an increasing work load with a diminishing technical staff. One of the consequences was that final reports were sometimes not available to the physicians until the evening of the day that tests were requested. In order to alleviate this situation and provide a more rapid turn around of the laboratory data, an Early Ward Report system was instituted. The data available at 1:00 p.m. each day was printed and delivered to the wards by 3:00 p.m. These reports were incomplete, but usually had 70-90% of the day's work, and provided the physician with useful information and a minimum of delay. This system has been in operation for two months and is performing well. These reports as well as the final reports were delivered by hand because of the inadequate functioning of the pneumatic tube system.

2) Discharge Summary

A program was written to generate a "discharge summary" of any patient's laboratory data. We plan to use this summary for two purposes. A summary will be generated at any time upon the request of the attending physician. If the request is made the day before discharge, the attending physician will have the patient's laboratory data in summary format at the time of discharge and should find this useful in writing the narrative summary. The purpose for the discharge summary is to replace the isolated reports in the patient's clinical record thus reducing the considerable bulk of this record and also storing the data in a more readily interpretable form. This system has not yet been implemented but we are working with the Medical Records Department to solve the remaining problems.

3) Monthly Work Summary

A program was written to produce a statistical summary on a monthly basis of the Clinical Pathology Department workload, both in total numbers and broken down by Institute. This information should be of value in future analysis of the Department's activities.

4) Computer Lists for Nursing Department

A number of documents were produced which did not directly relate to the department's functions, but were useful to the nursing staff of the Clinical Center. These included Census Lists, Hold Breakfast Lists, Urine Collection Lists, Blood Drawing Lists, and TPR Lists.

These documents were in operation for much of the year and the comments from the nursing units were favorable.

5) Data Retrieval from Data Files

Specially formatted summary retrieval of laboratory data were performed on request of the clinical physicians. This data was used for research activities and for conference presentations and service analysis. We do not plan to expand this service and are holding discussions with the Division of Computer Research and Technology aimed at turning this function over to them.

Future Plans in Data Processing

Our most urgent need and our primary target for development next year will be a back-up system for a routine operation of the laboratories. We are currently using a prototype back-up system in which the electric accounting machines, such as the sorters, printers and collators, serve to process the punched card information whenever the CDC computer is down. Although this system enables us to continue operation under such emergency conditions, it is slow and cumbersome. A more efficient alternative system utilizing a back-up computer is urgently needed. Most of the necessary hardware for such a system has already been obtained and is currently being used to interface the remote data entry consoles with the CDC computer. One of the tasks that we will begin next year will be the development of a system of programs to back up the Beta System utilizing our PDP-8 computers and the associated peripheral equipment. This back-up system will be nowhere near as sophisticated as the primary system and will perform only those basic functions essential to the continued operation of the laboratories.

The second priority project will be continuation of the effort to develop a feedback system for the remote data entry consoles. A buffered interface between the PDP-8 computers and the CDC 3200 was developed during FY 71 and is ready for implementation. We will work on the necessary software to utilize this buffered interface in a feedback type of communication system, which will speed up and expand our checking and verification procedures on the data entered through the remote consoles. The quality control subsystem which was used under the Alpha System became inoperable when the file formats were changed with the implementation of the Beta System. A replacement quality control subsystem which is compatible with the Beta files will be developed next year. This subsystem will incorporate the standard parameters, such as mean, standard deviation, and coefficient of variation and will periodically generate tables and graphs for use in monitoring the day-to-day control of each analytical system. The quality control subsystem will later be expanded to encompass real-time monitoring and control of the laboratories.

In the Chemistry and Hematology Laboratories combined, 16 tests were performed in the real-time on-line mode. The development program for next year includes the conversion of five additional tests to this mode of operation.

Three tasks are scheduled for next year's development program which are carryovers from the previous year's work and will require minimum effort for completion. These tasks are: (1) final modification and implementation of cumulative patient reports; (2) incorporation of bone marrow reports in the Beta file; and (3) conversion to the most recent form (4.2 version) of the MSOS executive operating system.

All of the foregoing tasks are scheduled for completion under next year's contract with Berkeley Scientific Laboratories.

We are undertaking a modest in-house development program next year. Under this program, work is currently under way on a computer oriented system for the Microbiology Service. Work will continue on this program and implementation of the first phase is projected for next year.

A second in-house task involves exploration of the possible uses of the Cathode Ray tube terminal as an input-output device for the Beta System. There are two specific areas in which the use of this device will bring about a definite improvement in the operating system. Correction of erroneous data in the files is presently a difficult procedure and requires a considerable amount of operator time. Utilizing a Cathode Ray Tube terminal a program will be developed to enable the operator to retrieve and display a given segment of the files on the CRT screen. The files can thereby be quickly checked for erroneous data and any such data can be corrected on the screen and then returned to the file, thus overlaying the erroneous data with the corrected data. The second technique planned for early application is retrieval of fresh laboratory data at the request of the clinical or laboratory physician. Physicians will thereby be able to obtain any available laboratory data with a minimum of delay and inconvenience and will not have to wait for daily reports.

A third area of in-house research is the capture of data from the on-line real-time analytical system. As it is presently constituted, any failure in the on-line real-time system inevitably renders the system inoperable for that day. This means that the data from the on-line real-time analytical instruments must be manually processed and entered into the computer via the Remote Data Entry Consoles, thus losing all the advantages of real-time on-line operation. We will investigate the feasibility of a data capture system utilizing a magnetic tape so that when a failure occurs, the raw data can be temporarily stored on a magnetic tape and when full operation is restored, this data can be entered from the tape into the system, thus eliminating the need for manual processing of the results.

The final area of investigation planned for the next year is the use of an optical character reader for entry of data into the system. An optical character reader is able to interpret printed alphabetic and numeric characters and is superior to all other means of data entry in that the same character that is interpreted by the machine can also be interpreted by the human eye. The generation of entry documents is also greatly simplified since these can be printed on an IBM Selectric typewriter with a special OCR print ball. Plastic addressograph type identification plates can also be utilized. The concept of optical character reading has been under study for some years and has generated considerable enthusiasm in data processing circles. Unfortunately the instruments available were unreliable and inadequate and served to dampen much of that enthusiasm. More recently, however, Control Data Corporation has developed an improved instrument, the Model 915 Optical Character Reader. We have examined this instrument linked to the 1700 computer at the Baltimore U.S. Public Health Service Hospital and we feel that it comprises a much improved and workable system. We plan to install one of these instruments on our 3200 computer and will investigate the possible applications over the next year.

Office of the Chief

Service Productivities

The total Clinical Pathology Department workload, in terms of tests performed, increased 23.4% over the previous year. During the same period the average patient census decreased 3% making the overall increase in demand for laboratory services per patient 24.2%. The test work units/patient/day increased 20.8% from 14.4 in 1970 to 17.4 in 1971. At the same time that there was an increased workload of 23.4%, the total available technologist hours increased 9.9%. This resulted in an increased workload for each technologist of 21.3% over 1970.

Table 1A lists the average monthly workload statistics by quarters for FY 1971 for the Clinical Pathology Department.

Tables 1B, 1C, and 1D provide a breakdown of the data listed in table 1A by each of the laboratory services.

Training

The resident training program which had been curtailed in Fiscal 1970 did not admit any new residents in July 1970. Four second year residents participated in the training program with three of them, Dr. Emanuel Abrams, Dr. Andrew Horvath, and Dr. Henry Tan, participating actively in the clinical activities of the Hematology Service for the whole year. Dr. Russell rotated through each of the services this year because he had spent last year exclusively in Clinical Chemistry.

It was felt by the present senior staff that the decision to curtail and then discontinue the residency was ill advised considering the shortage of physicians who are well trained in laboratory medicine. This department is particularly fortunate to have the variety of clinical material to study that exists in the Clinical Center and the ready expertise of many renowned individuals in diverse areas of medical science. In addition, the data processing development which exists in this department makes it ideally suited to training physicians in the extremely confusing, complex and expensive area of automatic data processing. The very considerable expertise that Drs. Daniel Bruce and Richard Friedman brought to this activity was and will be used for developing and teaching methods for the reasonable use of computers in the laboratory.

As noted earlier in this report, this recommitment to residency training must be done at the expense of departmental research programs. The senior staff is willing to make this decision as long as the present level of support of the department is temporary and increased personnel positions and funds become a reality in the very near future.

The senior staff and residents continued to have weekly Clinical Laboratory Rounds at which laboratory problems and/or interesting patients were discussed. Some of the service chiefs were able to conduct weekly or biweekly conferences with their technical staff as time permitted. Each of the services participated in clinical rounds with various institutes as noted in each service description.

The professional and technical staff continued formal training through the NIH Graduate Program and other institutions. A summary of courses completed by the staff in FY 1971 is included in table 2.

Training of technical and post-doctoral staff in the Cell Chemistry Laboratory was through direct supervision of their research activity and informal discussions. A joint bi-weekly seminar was held by scientists from other Institutes, and the staff of Cell Chemistry Laboratory actively participated.

Research

Dr. Behzad Mohit, with the excellent technical assistance of Mrs. Mary Ellen Cassidy, studied immunoglobulin heavy and light chain synthesis in clones of hybrid cells. It was shown that when a somatic hybrid cell is formed between an immunoglobulin producing cell and a non-producing cell, the resulting cell does not shut off its immunoglobulin synthesis. These findings strongly argue against the "repressor" theory of Jacob and Monad being operative in cellular differentiation. The findings were presented to an NIH-wide audience and will be published shortly.

Dr. Mohit also worked on the correlation of immunoglobulin synthesis with expression of histocompatability antigens on cell surfaces. The hybrid cells developed in the laboratory are being used to study the relationship between the synthesis of these two classes of molecules important in graft rejection and immune response.

Dr. Kang Fan, Senior Staff Fellow in the Cell Chemistry Laboratory, worked on (a) establishing a cell-free system for in-vitro study of immunoglobulin synthesis and rat liver albumin synthesis. These studies were partially successful but need further effort. (b) Isolating, purifying and identifying virus-like particles found in myeloma tumor cells. Considerable progress has been made toward this goal. (c) Conducting a kinetic study of synthesis of RNA and virus-like particles in tissue culture established immunoglobulin producing mouse myelomas. These studies were completed and are of great interest in the fields of oncology and immunology.

Dr. Arthur Boylston, Clinical Associate assigned to the Cell Chemistry Laboratory, worked on development of new hybrid cell lines for further study of the mechanism of immunoglobulin synthesis and development of solid phase immunoabsorbants using sepharose beads for quantitating the immunoglobulins produced by cells. These studies are still in progress.

Dr. Mohit collaborated with Mr. Nelson Braslow, Laboratory of Technical Development, NHLI, on the development of a new cell separation method by liquid-liquid counter current distribution. The procedure is intended to be useful as a general method of separating cells of different morphology and function in a mixture of cells.

Dr. Mohit collaborated with Dr. Daniel Nebert, NICHD, on the hybridization of liver cells and myeloma cells in tissue culture. These studies are intended to shed light on the pathway of drug detoxification mediated through the enzyme aryl hydroxylase present in liver cells.

Drs. Mohit and David Kohne, Carnegie Institute, Washington, D. C., collaborated on hybridization studies with nucleic acids of immunoglobulin-producing cells. These were continuation of studies started by Dr. Robert Shleser, University of California, Davis. They are of considerable significance for understanding of the mechanism of immune response.

Dr. Mohit and Dr. Günter Blobel, Rockefeller University, New York, worked on the isolation of messenger RNA from cloned myeloma cell lines. These studies are progressing and if successful, will be the first time that a mammalian messenger RNA has been isolated. Availability of cloned immunoglobulin cell lines and solid phase radioimmunoassay methods as well as the expertise of Dr. Blobel in cell fractionation gives this project a high chance of success.

Staff Appointments and Changes

Dr. Emanuel Abrams completed his residency in Clinical Pathology and joined the Bioscience Laboratories in Van Nuys, California as a pathologist.

Dr. Behzad Mohit will terminate his appointment on June 30, 1971.

Dr. Philip Greipp completed his assignment as a Staff Physician and will become an Assistant Resident in Medicine at the Mayo Clinic, Rochester, Minnesota.

Dr. Kang Fan completed his Staff Fellowship and joined the staff of the Department of Genetics, University of California, Davis.

Dr. Charles Russell completed his residency in Clinical Pathology and has taken a fellowship in Nuclear Medicine at the Johns Hopkins Medical School in Baltimore, Maryland.

Dr. Arthur Boylston was appointed a Clinical Associate and is working in the Cell Chemistry Section.

Dr. Richard Friedman was appointed a Clinical Associate and is working in Research, Development and Laboratory Automation.

Dr. David W. Thomas, a Visiting Scientist from Adelaide, Australia, joined the Clinical Chemistry staff.

Dr. Vee Jay, a microbiologist, joined the staff of the Microbiology Service as a Staff Fellow.

Appointments within the Department

Dr. James MacLowry was appointed Acting Chief, Clinical Pathology Department.

Dr. Harvey Gralnick was appointed Chief, Hematology Service.

Dr. Daniel Bruce was appointed Acting Chief, Research, Development and Laboratory Automation Section.

Dr. Harry Givelber was appointed Assistant Chief, Hematology Service.

Dr. Nathan Gochman was appointed Assistant Chief, Clinical Chemistry Service.

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PRESENTATIONS AT MEETINGS

Abrams, E.: Evaluation of Technicon Automated Platelet Counter using Fingerstick Samples. Talk given at American Society of Clinical Pathology, Las Vegas, Nevada, February, 1971.

Bruce, D. W.: Analysis of data processing needs in the clinical laboratory. Workshop conducted at the American Society of Clinical Pathology, August 1970 and February, 1971.

Bruce, D. W.: Data Processing in the Clinical Pathology Department, NIH. Talk given to Preventive Medicine and Laboratory Officers Symposium sponsored by the Walter Reed Army Institute of Research. Bethesda, Maryland, April, 1971.

Friedman, R., Bruce, D., and MacLowry, J.: Computer assisted identification of Enterobacteriacea. American Society for Microbiology, Minneapolis, Minnesota, May, 1971.

Gochman, N.: Chairman, Session on Biochemical Applications of Electrode Instrumentation. Symposium on Recent Developments in Research Methods and Instrumentation, NIH, Bethesda, Md., October, 1970.

Gochman, N.: Automated clinical analysis. Talk given at NIH/NBS Symposium on Recent Developments in Research Methods and Instrumentation. Gaithersburg, Maryland, October, 1970.

Gochman, N.: Automated clinical analysis with especial reference to atomic absorption. Seminar presented at Johns Hopkins University Medical School. Baltimore, Maryland, November, 1970.

Gochman, N.: Workshop lecture presented at the 3rd National Conference and Exposition on Electronics in Medicine, Laboratory Automation. Boston, Massachusetts, April, 1971.

Gralnick, H. R.: The hemorrhagic diathesis of acute promyelocytic leukemia: Pathogenesis and treatment. Talk given at International Society of Hematology. Munich, Germany, August, 1970.

Gralnick, H. R., Givelber, H., Shainoff, R., and Finlayson, J. S.: Congenital dysfibrinogenemia (fibrinogen Bethesda) associated with impaired fibrinopeptide release. Talk given at American Society of Hematology. San Juan, Puerto Rico, December, 1970.

MacLowry, J. D.: Review of bacteriology and pharmacology of antibiotics. Lectures given to Otolaryngology Basic Science Course, Armed Forces Institute of Pathology, Washington, D. C., April 1971.

Marchesi, S. L., Shulman, N. R., and Gralnick, H. R.: Characterization of human Factor VIII. Talk given at American Society of Hematology, San Juan, Puerto Rico, December 1970.

Mohit, B.: Immunoglobulin synthesis in a hybrid cell line derived from a cloned mouse myeloma and a nonproducing lymphoma. Guest lecturer at Scripps Clinic and Foundation, LaJolla, California, June 1970.

Mohit, B.: Hybrid cell line from a cloned immunoglobulin producing mouse myeloma and a nonproducing mouse lymphoma. Guest lecturer at Stanford University Medical Center, Palo Alto, California, June 1970.

Mohit, B.: Segregation of heavy and light chain production in clones of a hybrid cell line. Guest lecturer at University of Alabama Medical Center, April 1970.

Mohit, B.: Segregation of heavy and light chain synthesis in clones of a hybrid cell line. Invited lecturer, Immunology Branch, NIAID, April 1970.

Nishi, H. H.: A mechanized direct digital control pipet for ultramicro-chemical systems. Talk given at the 22nd National Meeting of the American Association of Clinical Chemists. Buffalo, New York, July 1970.

O'Neal, W. R.: An automatic, saccharogenic method for the determination of serum amylase. Talk given at the 22nd National Meeting of the American Association of Clinical Chemists. Buffalo, New York, July 1970.

Young, D. S.: Establishment of uniform dietary conditions for detailed metabolic studies. Talk given at the 22nd National Meeting of the American Association of Clinical Chemists. Buffalo, New York, July 1970.

Young, D. S.: Referee methods: Can they be developed for clinical analyses. Talk given at NIH/NBS Symposium on Recent Developments in Research Methods and Instrumentation. Gaithersburg, Maryland, October 1970.

Young, D. S.: Extraneous influences in the composition of body fluids. Talk given to Staff of the Pepper Laboratories, University of Pennsylvania. Philadelphia, Pennsylvania, February 1971.

Young, D. S.: Influence of a chemically-defined diet on the composition of serum and urine. Talk given at the Third Annual Symposium on High-resolution Analyses and Advanced Analytical Concepts for the Clinical Laboratory. Oak Ridge, Tennessee, March 1971.

Young, D. S.: Discussion leader, Session on Requirements of the Clinical Laboratory that affect the choice of new analytical systems. 3rd Annual Symposium on High Resolution Analyses and Advanced Analytical Concepts for the Clinical Laboratory. Oak Ridge National Laboratory, March 1971.

Young, D. S.: Chairman of Sessions on Biomedical Profiling Technicon Congress. New York, November 1970 and Silver Spring, Maryland, April 1971.

Young, D. S.: Computerization of Clinical Chemistry at the National Institutes of Health. Talk presented at Conference on Clinically-Oriented Laboratory Data. Continuing Medical Education Program. State University of New York at Buffalo, May 1971.

Young, D. S.: What is wrong with present methods of standardization of certain automated equipment. Talk presented at Symposium in Clinical Chemistry Hershey Medical Center, Hershey, Pennsylvania, May 1971.

OTHER ACTIVITIES

Gochman, N.

Served on the Planning Committee for the NIH Symposium on Research Methods and Instrumentation as a representative of the American Association of Clinical Chemists.

Attended the National Council Meetings of the National Committee for Clinical Laboratory Standards as the NIH delegate in September 1970 and April 1971. This is an organization of government agency, industrial, and professional society members which is developing standards for improved laboratory materials and procedures. Served as a member of the NCCLS Area Committee on Instrumentation and attended the planning sessions of this group in Atlanta, September 1970 and Las Vegas, February 1971.

Attended a conference on "Perspectives in Laboratory Medicine" as an invited representative of the Clinical Pathology Department, University of Vermont, October 1970.

Young, D. S.

Served on the Editorial Boards of Clinical Chemistry and Analytical Letters and on the Executive Committee of the Board of the former journal.

Member of the Automation in Medical Laboratory Sciences Review Committee of NIGMS and a member of the National Bureau of Standards Advisory Panel on Clinical Standard Reference Materials.

Invited participant in the NIGMS UV Analyzer Program Conference, February 1971 and the NIAMD Artificial-Kidney/Chronic Uremia program workshop on gastrointestinal sorbents in uremia. February, 1971.

Young, D. S. and Peterson, J. I.

Received a patent for development of a urine preservation package. October 1970.

Table 1A

Average Monthly Workload Statistics for the Clinical Pathology Department, FY 1971

	1st Quarter	2nd Quarter	3rd Quarter	Estimated 4th Quarter	Estimated 12 Month Projection	FY 1970 Total
Average Patient Census	336	323	333	329	330.2	340.9
Available Tech. Days	1,133.6	1,133.1	1,163.5	1,130	13,681	12,454
Total Test Work Units	120,558	114,685	128,120	120,000	1,450,089	1,234,971
Total Tests	76,467	81,784	83,741	80,000	965,976	783.030
Test Work Units/ Tech. Day	105.4	101.2	110.1	106.1	105.9	99.2
Test Work Units/ Patient Day	16.8	17.1	18.5	17.1	17.4	14.4

Table 1B

Average Monthly Workload Statistics for the Chemistry Service , FY 1971

	1st Quarter	2nd Quarter	3rd Quarter	Estimated 4th Quarter	Estimated 12 Month Projection
Average Patient Census	336	323	333	329	330.2
Available Tech. Days	386.3	371.1	396.5	390	4,632
Total Test Work Units	48,397.3	45,362.2	51,370.1	48,000	579,387
Total Tests	36,373	35,311	40,723	38,000	451,221
Test Work Units/ Tech Day	125.3	122.2	129.6	123.1	125.1
Test Work Units/ Patient Day	6.7	6.7	7.5	6.8	6.9

Table 1C

Average Monthly Workload Statistics for the Hematology Service, FY 1971

	1st Quarter	2nd Quarter	3rd Quarter	Estimated 4th Quarter	Estimated 12 Month Projection
Average Patient Census	336	323	333	329	330.2
Available Tech. Days	402.3	416	417	405	4,921
Total Test Work Units	40,754	39,569	45,128	42,000	502,353
Total Tests	25,412	32,339	28,524	28,000	342,825
Test Work Units/ Tech. Day	101.3	95.1	108.2	103.7	102.1
Test Work Units/ Patient Day	5.7	5.9	6.5	6.0	6.0

Table 1D

Average Monthly Workload Statistics for Microbiology Service, FY 1971

	1st Quarter	2nd Quarter	3rd Quarter	Estimated 4th Quarter	Estimated 12 Month Projection
Average Patient Census	336	323	333	329	330.2
Available Tech. Days	345	346	350	335	4,128
Total Test Work Units	31,407	29,754	31,622	30,000	368,349
Total Tests	14,682	14,134	14,494	14,000	171,930
Test Work Units/ Tech. Day	91.0	86.0	90.3	89.5	89.2
Test Work Units/ Patient Day	4.4	4.5	4.6	4.3	4.5

Table 2

List of Formal Training Courses Completed by Staff FY 1971

Commissioned Officers			
Greipp, P. R., M.D.	Current Concepts in Medicine	9/17-18/70	Bethesda Naval Med. Ctr.
Greipp, R. R., M.D.	Radiologic Health for Radionucleide Users	10/5-9/70	NIH
Horvath, A. E., M.D.	Gen. 12: Reading Improvement	Fall 70	FAES
MacLowry, J. D., M.D.	Streptococci and their Diseases	5/12-14/71	Univ. of Minn.,Minn.,Minn.
Civil Service			
Bayes, R.	Lab. Management Workshop, Sci. Prod.	3/17/71	New Carrollton, Md.
Bowman, M.	Immunoglobulins	11/12-13/70	ASH, Philadelphis, Pa.
Bowman, M. B.	Gen. 19: Prob. Solv. in Mgt. & Adm.	Spr. 71	FAES
Bresler, H. M.	A personnel improvement program	7/22/70	Watergate Hotel,Wash.,D.C.
Byrd, L. T.	Atomic Absorption	11/9-13/70	Instr. Labs, Boston, Mass.
Feld, M.	Hospital Supervisory Training	Spr. 71	Am. Mgt. Assoc.,NIH, 31
Gersch, S. M.	Intr. to Exp. Statistics	Fall 70	FAES
Gersch, S. M.	Stat. 100: Intro. to Exp. Statistics	Spr. 71	FAES
Heibel, H.	Automated Data Handling, Sci. Prod.	3/16/71	New Carrollton, Md.
Hess, S. M.	Biochem. 100: Intro Biochemistry	Fall 1970	FAES
Hess, S. M.	Calculus	Fall 70	FAES
Huber, C.	Blood Gas System Training Course	10/70	Instr. Labs., Boston, Mass.
Jackson, K. K.	4-105 Basic Concepts of Data Proc.	Spr. 1971	USDA
Jackson, K. K.	Basic Mathematics, Rev. of Arith.	Summer 70	USDA
Jackson, K. K.	Basic Mathematics, Rev. of Arith.	Fall 1970	USDA
Langill, R. A.	Biol. 102: Medical Mycology	Spr. 71	FAES
Lechner, T. J.	Coulter Counter Mod. S. Training	Feb. 17/71	Coulter Elec.,Cranford,N.J.
Nutter, C. D.	Medical Mycology, Biol. 102	Spr. 71	FAES
Ruberg, J.	Preventive Maint. of Lab. Equip.(S.P.)	3/18/71	New Carrollton, Md.
Schlam, M. L.	Spec. Topics in Biochemistry	Fall 70	American University
Schlam, M. L.	Spec. Topics in Biochemistry	Spr. 71	American University
Schmitz, J.	Tr. Seminar for AutoAnalyzer Mod II	4/12-16/71	Technicon, Tarrytown,N.Y.

Table 2

List of Formal Training Courses Completed by Staff FY 1971

(Cont.)

Civil Service			
Shearon, M. P.	Mgt. of Automatic Data Proc. Systems	Fall 70	American University
Spina, H. L.	Biochem. 10: Mathematical Preparation	Spr. 71	FAES
Straw, N.	ASCP Workshop	9/14-15/70	Atlanta, Georgia
Straw, N.	Lab. Mgt. Workshop, Sci. Prod.	3/17/71	New Carrollton, Md.
Tan, H.	Topics in Funct. Analysis, MA 289	Fall 70	Geo. Washington Univ.
Tan, H.	Topics in Funct. Analysis, MA 290	Spr. 71	Geo. Washington Univ.
Tan, H.	MA 123: Linear Algebra and Matrix Theory	Spr. 71	Geo. Washington Univ.
Wages, B.	Lab. Mgt. Workshop, Sci. Products	3/17/71	New Carrollton, Md.
Woodson, W.	Seminar Instrument Repair, Sci. Products	3/71	New Carrollton, Md.
Woodson, W.	Tr. Seminar for AutoAnalyzer, Mod. II	4/12-16/71	Technicon, Tarrytown, N.Y.
Yasukochi. P. A.	Biochem. 100: Intro. Biochemistry	Fall 70	FAES
Yasukochi, P. A.	Preventive Maint. of Lab. Equip. (S.P.)	3/18/71	New Carrollton, Md.

July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

DEPARTMENT OF DIAGNOSTIC RADIOLOGY

CC-64
Serial No.

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ACCOMPLISHMENTS

The most important accomplishment of the Department of Diagnostic Radiology in fiscal year 1971 was the provision of the highest quality, most advanced and complete diagnostic radiology service for the Clinical Center patients. Chest X-ray services were provided for NIH and the Rocky Mountain Laboratory employees with additional emergency service for the former.

A total of 45,616 X-ray examinations were performed on 27,795 patients and employees during the year (Table 1). In comparison with the 1970 volume (Table 2), the significant increase of 2,293 patients and 4,824 X-ray examinations is noted. The decrease of 263 special study examinations was directly related to a change in the lymphoma protocol which deleted most of the lymphangiogram studies. It is anticipated that this volume will be increasing as new special studies are initiated.

A number of visitors both announced and casual were received in the Department. There were approximately 25 from the States, and the foreign group included Drs. Arduino Batti from Milan, R. D. Lawrence and David Trapnell from London, Helmuth Salger from Munich and 35 assorted Austrian physicians on a group tour.

In the civic duty category, we allowed two X-ray technology students from the Montgomery College training program to observe diagnostic radiographic cardiac and special study procedures for one month each and employed two disadvantaged persons for a summer tour of duty.

Two of our Clinical Associates, Dr. John Buchignani and Dr. Peter Shimkin, were certified by the American Board of Radiology following examination on June 2.

In addition to routine duties, the Chief conducted 9 Civil Service hearings as a grievance review officer; continued as a consultant to the Bethesda Naval Center on the radiology of congenital heart disease; continued as USPHS counselor for the Radiological Society of North America; continued as a member of the Diagnostic Research Committee, NCI; continued as a member of the Commissioned Officers Medical Review Board; served as a member of the ad hoc committee on environmental differential hazard policy; served as a member of the Search Committee for Nuclear Medicine and served from March 1970 to the present time as Acting Chief, Nuclear Medicine.

A total of 31 candidates were interviewed in June for Clinical Associate positions in diagnostic radiology and nuclear medicine with four selected for radiology in 1974 and one selected for nuclear medicine in 1972.

Department staff members, Norma Martin, Joanne Evans, Katharine Sampson, John Daly and Charlie Lawrence, were recommended for and received quality increases for their outstanding performance.

The Department staff contributed to many professional conferences and programs throughout the year:

1. Dr. Richard Jaffe presented monthly conferences on the radiological aspects of congenital heart disease to the residents and staff of the Department of Radiology at the Bethesda Naval Center.

2. Dr. Jean Herdt participated in the weekly lymphoma staging conference of NCI.

3. Drs. Jean Herdt, John Buchignani, Peter Shimkin, Robert Krugman, Albert Cook and Richard Jaffe presented the radiological aspects and discussion of patients at the bimonthly Clinical Center grand rounds.

4. Dr. Jean Herdt discussed Radiologic Techniques and Results at the Conference of the Combined Clinical Staffs - Recent Advances in the Diagnosis and Therapy of Diseases of the Spinal Cord on March 25.

5. Dr. John Buchignani presented a paper, Radiation Dosimetry in Full Chest Tomography, at the annual meeting of the USPHS Clinical Society in Galveston, Texas, on April 4.

6. Dr. Jean Herdt presented a lecture, Aspects of Special Study Techniques, to the D. C. Society of Radiological Technologists at a meeting on October 10 at NIH for which the Department served as host.

7. Mr. Neil French served as president and educational chairman for the D. C. Society of Radiological Technologists for the year and presented an exhibit, Review of Routine Positions, at the May 8 meeting.

8. Orientation programs for new Clinical Associates were presented by the Chief to the NCI Surgical Branch and NINDS.

9. The Chief and Mr. Russell Rankin served as consultants in the planning of the clinical areas for NICHD and for the new research building for this Institute.

10. Dr. Peter Shimkin presented a series of three lectures on the radiologic manifestations of endocrine disease to the Reproductive Research Branch, NICHD, on January 7, January 14 and March 4.

11. Dr. Jean Herdt presented the annual address, Spinal Cord Angiography, to the Connecticut Valley Radiologic Society on October 23.

SIGNIFICANT CONTRIBUTIONS TO RESEARCH

Contributions to research programs by the Department were as many and varied in nature as the scope of the definition of research allows. Utilizing the definition in its broadest application, the diagnostic radiological services supported many research projects. In this category were the bone and lung biopsies and bronchial brushing under fluoroscopic visualization; catheterization and blood sampling of any artery or vein that can receive a catheter with relative safety; ultrafine polytomography of any structure; cineradiography and videotape recording and other special diagnostic procedures which greatly advance research information on the clinical scene.

Special adaptations and modifications of equipment and techniques permitted significant in vivo research on the patient following demise.

The availability of animal radiography and autoradiography advanced many research investigations.

Consultative services were provided to any investigator who wished to use radiological modes; to advise on patent requests associated with grants; and to the National Library of Medicine for potential value of publication of foreign manuscripts and books that pertain to radiology.

In the interest of research and design of equipment and accessories which will lessen radiation exposure, we conducted studies on automatic X-ray beam callimators and a device which provides a read out of area radiation exposure to the patient. In cooperation with Radiological Health personnel, our equipment was made available for testing and setting up recommended national radiation safety standards for equipment.

Individual research pursuits of staff members included:

1. Dr. John S. Buchignani, in collaboration with Radiation Safety, continued evaluation of radiation dosimetry in whole chest tomography and in all fluoroscopic procedures.

2. Dr. John S. Buchignani and Dr. Peter Shimkin developed a new technique for sialography using subtraction methods.

3. Dr. Albert Cook and Dr. John Buchignani conducted an in-depth study of familial facial osteodystrophy.

4. The Chief, in collaboration with Dr. John Decker, NIAMD, continued studying unilateral hip disease utilizing new methods for early detection.

5. Dr. Jean Herdt, in collaboration with Dr. Giovanni Di Chiro, NINDS, continued in the intensive investigation of all aspects of vascular disease manifestations in the spinal cord.

6. Dr. Richard Jaffe, in collaboration with NHLI scientists, continued their efforts to establish criteria and methods to differentiate constrictive paricarditis from restrictive myocardial disease, comparing the natural history versus surgical followup of congenital coronary arteriovenous fistulas, and to establish roentgenographic criteria for the diagnoses of tricuspid valvular disease.

7. Dr. Kent Pearson's research investigations included roentgenographic characteristics of Prader-Willi Syndrome; lung and bone abnormalities in Waldenstrom's macroglobulinemia with Dr. Michael Vermess; manifestations of systemic sporotrichosis; dense bone disease - von Buchems, osteopepetrosis, hyperphosphatasia, Engelmann's disease, etc.; spinal cord arteriovenous malformations with Dr. Giovanni Di Chiro; arterial structures causing duodenal filling defects with Dr. Peter Shimkin, and paravertebral density simulating calcified aortic aneurysm in scoliotic patients with Dr. Albert Cook.

8. Research interests of Dr. Peter Shimkin included percutaneous and transaxillary placement of indwelling catheters in the hepatic artery for chemotherapy of carcinoid syndrome and hepatoma, in the splenic artery for chemotherapy perfusion of hypersplenism, and in the thyroid veins for sampling parathyroid hormone levels.

9. Dr. Michael Vermess, in addition to the study of osseus manifestations of Waldenstrom's disease with Dr. Kent Pearson, evaluated the angiographic findings in all cases of focal motor epilepsy seen at NIH with Dr. Giovanni Di Chiro.

MAJOR PROBLEMS ENCOUNTERED

Personnel turnover is a relatively constant major problem with this year's rate being 19%. Although this is lower than some other years, it remains undesirable. None left because of working conditions. However, one typist did transfer to HISTMA which offered a higher potential for advancement as well as an immediate grade increase. One employee who left in July returned to the Department staff on April 5 and one who left on April 3, 1970, is now seriously considering returning.

The second rather constant major problem is that of sick leave. In addition to the usual colds, diarrheas and sundry ailments, there were two pregnancies with one delivery to date; two lung surgeries with one benign and one inoperable cancer; one breast surgery; two gallbladder surgeries; one case of tuberculosis, and two incidencies of fractured feet.

Although equipment breakdown did present some problems, these were far fewer than in previous years. The Philips X-ray Company replaced, at their cost, the basic driving mechanism of our most highly specialized tomographic unit. This unit had never produced for us the quality work that had brought renown elsewhere. The portion replaced was easily worth half the original cost of $44,000. Since most companies will not make such replacement, this gesture was much to the credit of this company.

With the termination of the present war in the relatively near future, the problem of attracting and retaining a permanent radiology staff should be urgently considered. There is always the very real possibility that the future clinical associates may not meet their NIH commitments if the draft pressure recedes. The fact that radiologists have a clinical rather than laboratory mission makes their future commitment to NIH considerably weaker than for those who may find a greater basic research opportunity here than elsewhere. Our present permanent staff of three includes two commissioned officers who will have completed 20 years' service in 1972 and one civil servant who came for limited experience and plans to leave in approximately one year. Should the present staff be completely depleted by these mechanisms, the only ready solution would be that of contracting services. Under the contractual program of the V.A., the salaries of specialists are in line with those of the surrounding community. Since contracting patient care service may be far less desirable in quality, it may be the proper time for consideration and promotion of radiologist pay scales at least on the same plane as academic institutions; namely, $36,000 to $60,000. Since the immediate prospects of such salaries in government are somewhat dim, a solution may be that of operating the Department on a fee-for-service basis with salaries arising from this income. Another possibility would be to use intramural grant programs to supplement the allowable salaries. Whatever the mechanism, government institutions will need to meet community competition for radiologists when the military service requirement dissolves.

CHANGES AND IMPROVEMENTS MADE

The reclassification of three technician positions; namely, the chief technician, the heart catheterization laboratory technician, and the chief special studies technician from GS-9 to GS-10 in the first instance and GS-7 to GS-8 in the following two has certainly made strides toward attracting and retaining high quality personnel in these very responsible positions. It also provides a ladder for highly motivated lesser grade technologists.

Certain new equipment improved the quality and efficiency of our operation. The Sienograph is an X-ray mammography unit with a long wave length emitting target (molybdenum). The quality of the mammograms was improved 200% following the acquisition of this unit. New standards of interpretation were needed to meet this quality change.

A battery powered portable X-ray machine (General Electric) saved 50% in the time required to do a portable chest film and considerably improved the quality of the film. The standard portable machine had to be positioned with respect to an electrical outlet and the variation in line voltage at different locations and times gave varying results in quality. The battery unit may be used in any location accommodating the multiple pieces of other equipment surrounging the very ill patient and the voltage output is a predictable constant.

Multiple new series of X-ray viewboxes have been installed in the south hall to accommodate increased viewing needs for fluoroscopy and special studies.

A carousel filing system was instituted for cineradiographic films. Prior to 1966, the NHLI maintained the file of heart cine studies. When the change to storage in the Department was agreed upon, we received several thousand cans of cine film. After having tried several filing methods and running out of available space, the carousel method was elected.

After two years of multiple delays, the portable 90 second X-ray processor became functional. It is predominantly used in our neuroradiology procedure room and used when needed in the 10A neuroradiological suite and the Clinical Center surgery wing. It is easily rolled to these areas and has quick connectors for the water source.

Prior to this year, certain X-ray studies such as mammograms and subtraction studies had to be hand processed or processed in a 3-6 minute automatic processor. After all of our processors were converted to 90 second timing, these studies required hand processing which is very time consuming. Kodak developed and marketed rapid processor industrial type film early this year allowing us to save the several hours per week formerly devoted to hand processing.

PROPOSED FUTURE OBJECTIVES

Provision of the highest quality and most efficient diagnostic radiological service to patients will continue to be the major future objective. Continuous evaluation of techniques, scheduling and reporting as well as being responsive to criticism and changing needs will assist in attaining this goal. Constant awareness and assessment of new methods in special studies is essential to progress in this rapidly advancing and informative facet of radiology.

The redesigning and redecorating of the main patient reception area as well as other areas of the Department should be realized in the coming year. The arrangement of the reception area has been most undesirable in that it is not easily recognized from the elevator lobby; the receptionist has her back to the approaching patient and often cannot be seen due to a structural column; and the area is inconveniently divided by a wall which serves no useful purpose.

The proposed acquisition of a remarkable, recently designed instrument, the Machida fiberoptic bronchoscope will provide an amazing new dimension in pulmonary diagnosis in the coming year. The Mayo Clinic and Johns Hopkins Hospital are presently the only institutions utilizing this instrument. Our present method of lung biopsy and bronchial brushing are performed under fluoroscopic localization, but with this instrument will be done under direct visualization. The view through this instrument is spectacular. Shortly to follow the bronchoscope, we hope to acquire the gastroscope, duodenoscope and colonoscope with fiberoptic viewing. These instruments will undoubtedly provide pre-treatment diagnosis and actually preclude the need for diagnostic surgery in many instances.

Each year microfilming has been projected for actuation in the following year. With the acquisition of the automated 3M microfilming device which produces

the 35 mm film attached to an IBM card, there was hope that the process would begin. Also utilization of miniatures was planned for NCI rounds to save the time of pulling and replacing film jackets. Some modifications of the film library were required before this unit could be utilized efficiently; namely, by the X-ray technologist who is assigned to this area to check film quality. Now that all these changes have been accomplished, it can surely be predicted that the microfilming and trial use of the minifilm on NCI rounds will begin in the very near future. If the minifilm is satisfactory for NCI rounds, it will be extended to other services.

HONORS AND AWARDS

No specific honors or awards were received during this year.

PUBLICATIONS

Eight publications authored or co-authored by the 9 member radiologist staff of the Department for the fiscal year 1971 included:

Berman, M. A., Buja, L. M., and Freed, T. A.: Roentgenogram of the Month. Frothy pink endobronchial secretions following total correction of tetralogy of fallot. Chest 57: 393-394, 1970.

Buchignani, J. S., and Shimkin, P. M.: Subtraction sialography. A new and improved technique. Oral Surg. In press.

Buchignani, J. S., Wagner, W., and Howley, J.: Radiation dosimetry in full-chest tomography. Radiology. In press.

Doppman, J. L., and Chretien, P.: Visceral pelvic venography in carcinoma of the cervix. Radiology 98: 405-410, 1971.

Herdt, J. R., Di Chiro, G., and Doppman, J. L.: Combined arterial and arteriovenous aneurysms of the spinal cord. Radiology. In press.

Herdt, J. R., Shimkin, P. M., Ommaya, A. K., and Di Chiro, G.: Angiography of vascular intraspinal tumors. Am. J. Roentgenol. Radium Ther. Nucl. Med. In press.

Schall, G. L., Anderson, L. G., Wolf, R. O., Herdt, J. R., Tarpley, T. M., Jr., Cummings, N. A., Zeiger, L. S., and Talal, N.: Sequential salivary scintigraphy in the evaluation of xerostomia in Sjögren's syndrome. JAMA In press.

Shimkin, P. M., Van Theil, D. H., and Ross, G. T.: Selective hypogastric arteriography in uterine choriocarcinoma. Am. J. Roentgenol. Radium Ther. Nucl. Med. In press.

Table 1

Number of X-ray Examinations

Fiscal Year 1971

	Patients	X-ray Examinations	Examinations per Patient
Inpatients	15,149	27,377	1.80
Outpatients	6,232	11,585	1.85
EHS	6,414	6,654	1.03
Total	27,795	45,616	

Table 2

Comparison of Activity

Fiscal Years 1970 and 1971

	1970	1971	Change
Total number of patients examined	25,502	27,795	+ 2293
Total number of X-ray examinations	40,792	45,616	+ 4824
Number of X-ray examinations per patient	1.60	1.64	+ 0.04
Total neurocardiovascular special procedures	1,580	1,317	- 263

July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

EMPLOYEE HEALTH SERVICE BRANCH

CC-04
Serial No.

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July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

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OCCUPATIONAL HEALTH AT NIH: SHARPENED GOALS AND NEW OPPORTUNITIES

1. During the past year many events occurred which strengthened our determination to practice meaningful preventive medicine within the overall occupational health program. A new NIH Associate Director for Clinical Care, who also serves as Director of the Clinical Center, was appointed and we are fortunate indeed that he recognizes the value of preventive medicine. An NIH Biohazards Committee was also formed indicating a recognition by top level management that more aggressive steps must be taken to protect employees form environmental hazards.

2. Encouragement of clinical research will sharpen our skills in providing preventive medical services more effectively. The past year therefore has been a significant period in that we seem to have made a total break from the older therapeutic approach to a preventive medicine approach in meeting our responsibilities. Although we continued to offer services which enabled us to meet medical emergencies as they occurred, we emphasized preventive medical services designed to detect illnesses before they became advanced or debilitating, and provided medical surveillance for the control of environmental health hazards. Through such direct medical services to employees and environmental surveillance activities, the NIH occupational health program was intimately concerned with any health or environmental condition that affected, or might have affected, any NIH staff member's performance and well being. In addition, both to the employee and management, to insure that both were given fair and equal treatment in the resolution of problems which occurred, or resulted from the occupational setting.

3. With increasing emphasis on community medicine we recognized an analogy to occupational medicine at NIH. We were in effect dealing with a community of more than 12,000 employees who spent, on an average, more of their waking hours here than they did either in the community or in their homes. Not only must we deal with the problems which are generated here at work, but also with the side effects of problems which are generated both in the community and in the home.

4. The basic authorization, Public Law 79-658, outlines four general program areas under which it is appropriate to discuss our 1970-71 activities.

a. Treatment of on-the-job illnesses and injuries
b. Pre-employment and other examinations
c. Referral of employees
d. Preventive programs relating to health

TREATMENT OF ON-THE-JOB ILLNESSES AND INJURIES

1. Care of medical emergencies remained one of our primary obligations because of the need for immediate effective action. As in the past, we carefully reviewed our medical procedures and updated those that needed revision. One of our staff nurses was assigned primary responsibility for coordinating emergency medical care and received special training through the American College of Surgeons. We made sure that we were capable not only of meeting the common medical and surgical emergencies, but also of handling those unusual intoxications and adverse reactions which could occur from exposure to toxic chemicals, biological agents, radioactive materials, etc., which are part of the NIH laboratory environment.

2. Biological hazards remained one of our primary concerns, requiring that our staff be alert to the possibilities that employees may be showing early signs and symptoms of relatively rare diseases to which they could have been exposed in their work. As in the past, we performed our functions in a rather quiet and unassuming manner, and were not too surprised that many individuals at NIH are not fully aware of our interests and involvement in the control of biological hazards. We recognize the fact that there may be many more individuals who could have occupationally related illnesses who do not come to our attention since we only see those individuals who either come to us voluntarily or who are sent to us. It is common knowledge that some supervisory personnel are prone either to minimize employee illnesses or to rely on corridor consultations with other physicians. In addition, we fully recognize our own limitations and avail ourselves of the excellent opportunities which exist at NIH, not only to obtain clinical consultations from the various Institute clinicians, but also to obtain laboratory studies from the Clinical Pathology Department and the specific laboratories where the exposed individuals work.

We made extensive use over the past 18 years of the frozen serum bank which now contains serum specimens on more than 7000 employees, mainly from the infectious diseases laboratories of DBS, NIAID, and from all Clinical Center employees. During the past three years, all new animal caretakers have had blood drawn for freezing and storing. All NCI employees working in Bldg. 41 also were covered in the serum bank program. We recognize that there are many other employees who could be included in the serum bank program, and hopefully the newly formed Biohazards Committee will create the mechanisms necessary to insure that such employees are included.

3. The need for improved medical services at the Poolesville Farm was recognized during the year. On-site visits were made by the Assistant Chief, emergency nurse coordinator, and safety personnel, and subsequent visists were arranged with the Director, DRS, and Associate Director, Clinical Center. Plans were formulated to conduct regular first aid training courses for key individuals at the Farm, and the first basic course has been completed under the direction of the NIH Fire Department in cooperation with EHS physicians and nurses. In addition, DRS was encouraged to hire a hospital corpsman, part of whose duties would be to render immediate first aid as may be needed. This concept was accepted by the Director, DRS, and we are hopeful that it can be implemented soon.

4. An explosive outbreak of tuberculosis occurred in a monkey colony shortly after its transfer from Puerto Rico to Bethesda. About a month after arrival, several of the monkeys were found to be reactive to tubersulin testing and autopsies were positive for active tuberculosis. The Monkeys were subjected to over-crowded conditions which were particularly difficult to correct because of the fact that they were housed in a rental building.

The primates were promptly relocated, placed in isolation, and then followed for tuberculosis by repeated tuberculin tests. Additional monkeys became positive and were sacrificed. The area in which the monkeys were housed was thoroughly decontaminated.

Our primary interest in the problem was to insure that all employees who were exposed would receive T.B. contact follow-up. Intense emotionalism developed in many of the occupants of the building and others who were exposed to the monkeys, and it became necessary to divide contacts into those whom we felt were significantly exposed and those whom we felt had only a casual exposure. Many individuals were included on this latter list because of their anxiety rather than because we felt they had a significant exposure. Individuals with an intimate exposure received chest X-rays and/or tuberculin tests, if known to be negative, with repeats scheduled at 3, 6 and 12 months. Casual contacts received initial X-rays and skin tests, with repeats scheduled at 6 months.

This incident reminded us that there is need for a more coordinated approach to environmental health problems at NIH. It appeared, for example, that the primates were transferred to Bethesda, and located in the Auburn Building without our knowledge or that of the Primate Quarantine Unit. In fact, we had no information that this laboratory would be transferred from Puerto Rico and therefore had no opportunity to review the medical records or obtain chest X-rays on these primate handlers after their arrival in Bethesda.

5. Hepatitis as an occupational health hazard received a great deal of interest this past year. Assisted by specialists in the Clinical Center Blood Bank, NIAID Clinicians, CC Director, and the CC Nurse Epidemiologist, 12 cases of hepatitis among patient care personnel were thoroughly evaluated. An initial cluster of four early cases among NCI personnel was Au antigen positive. In spite of this finding, however, a single source of infection could not be located. The other cases were in widely scattered locations, and no common source could be identified. In all incidents we were requested to provide gamma globulin for the contacts to the cases of hepatitis. In one of the cases we were asked to give gamma globulin to more than 40 persons. In no case could it be determined that contact was intimate enough to warrant administering gamma globulin. In spite of our reassurances, however, the demand grew and we consulted our infectious disease specialist who in turn consulted the Hepatitis Surveillance Unit at the National Center for Disease Control. We recognize the intense emotional reaction that occurs when a case of hepatitis is diagnosed, and we thoroughly investigate the nature of the contacts and provide whatever reassurance or prophylatic treatment that may be indicated.

Because of the fact that it has been clearly established that Au Antigen positive hepatitis can be transmitted by other than parenteral means, a surveillance program to test for hepatic enzymes and Au antigen was proposed for personnel

working in high-risk areas. Guidelines were also considered by the Infections Committee to establish procedures for reassignment of individuals with positive Au antigen and/or liver function tests discovered on periodic routine surveillance. New Clinical Center employees are also included in the surveillance program. Employees who receive gamma globulin as a result of close intimate exposure to a case of hepatitis also have blood drawn for Au antigen and enzymes.

6. We are obligated by law to report all illnesses experienced by occupationally exposed employees which come to our attention. During the past year we improved our reporting procedures in cooperation with the Plant Safety Branch which has the primary responsibility for maintaining Bureau of Employees' Compensation records. Intensive efforts were also made, through meetings with BEC officials, to clarify many of the gray areas of coverage and liability for work related injuries and illnesses.

PRE-EMPLOYMENT AND OTHER EXAMINATIONS

1. Contrary to impressions held by several key individuals at NIH, which we were surprised to learn about during the past year, complete pre-employment physical examinations have been obtained for more than 20 years on employees exposed to biological hazards. In fact, prior to two years ago, all new NIH employees received complete pre-employment examinations. Since that time, the Civil Service Commission has exempted applicants for so-called light duty positions from the pre-employment physical examination requirements. Even though these individuals were not examined by a physician, they were nevertheless interviewed by the nurse who obtained a brief medical history, arranged for a chest X-ray, and provided indicated immunizations and basic laboratory studies. Individuals with significant positive findings on this preliminary screening were then referred to a physician for a complete examination. Certain categories of employees, including Wage Board employees, those working under hazardous and/or strenuous physical conditions, patient care employees, food handlers, individuals working under exceptional stress and motor vehicle operators, continued to receive complete pre-employment physical examinations.

2. Many examinations performed in the Employee Health Service were partial examinations tailored specifically to meet the needs for which the examination was given. Many examinations were exceptionally thorough with data recorded electronically as in the case of NCI-EVIF employees working in Building 41. In addition, Fire Department, Guard Force personnel were offered periodic examinations because of the necessity for these individuals to be able to respond to emergencies without either endangering their own health or the safety and welfare of others. Grounds Maintenance personnel were offered periodic physical examinations because of the toxic chemicals and insecticides to which they are exposed in spraying operations. Part of their work-up included cholinesterase levels. Employees in the anaerobic chamber in Building 8 were offered physical examinations because of the stresses under which they work. Formula Room personnel were offered examinations because of the critical nature of their work in relation to infections control. Lastly, the Primate Quarantine Unit personnel of the Laboratory Aids Branch were offered examinations because of intimate exposure to sub-human primates, including chimpanzees, which are the source of B-Virus disease, hepatitis, tuberculosis, and enteric diseases.

Providing periodic physical examinations for occupational exposures was one of our most important functions.

3. We recognized that there are many other NIH staff members who could have benefitted from periodic examinations and other surveillance procedures. All of our programs were voluntary, consistent with the overall NIH philosophy which places responsibility on the principle investigator for insuring that biohazards are being adequately controlled within his own area. Such a system undoubtedly has many weaknesses and is based upon the assumption that individual responsible investigators are not only professionally competent, but also conscientiously concerned about the health and welfare of their employees. Staff limitations prevented us from performing more extensive periodic physical examinations, the value of which in any event, has not been conclusively demonstrated. Once again, we are eagerly awaiting recommendations of the new Intra-Institute Technical Committee on Biohazards in this regard.

4. Medical care, primarily health guidance and education, was offered to summer aid program employees who were mainly students from economically depressed sections of the metropolitan area. Screening examinations or interviews were conducted by the nurses, who then referred all significantly positive findings to the physician for further consideration. For many of these indivduals, this was their first contact with preventive medicine and a surprisingly high number of health problems were uncovered again this year. Limited treatment was offered in the Employee Health Service and referrals were made to appropriate private and community medical facilities.

5. At the request of the Plant Safety Branch, and as part of the comprehensive revision of parking regulations, all special parking permits for health reasons were revised during the past year. Efforts were made to apply consistent standards in issuing privileged parking permits. Many individuals with significant problems, but who could walk longer distances during summer weather, were issued permits which would be in effect only during the winter months, November through March. Recognizing that no other activity at NIH could perform this onerous duty any better than we could, we nevertheless would appreciate receiving the support of management when decisions are made which are not acceptable to the applicant and his friends. We attempted to be as objective as possible and when doubt existed made decisions favoring the individual.

REFERRAL OF EMPLOYEES

1. Because our medical staff does not have specialized clinical training and experience, except in the limited area of occupational medicine, we had continuing need for consultative services in the clinical specialties. These services were needed to assist us in evaluating possible work-related illnesses and injuries, to assist in proper referrals to private physicians, and to provide necessary consultations in our physical examination program, particularly pre-employment and occupational periodic examinations. We had little or no difficulty in obtaining consultations, primarily in dermatology, infectious diseases, endrocrinology, rheumatology, neurology, and surgery. Fortunately our psychiatric consultations are now being met through our own staff which includes 4 part-time psychiatrists who spend approximately a total of 60 hours per week on our Department.

2. Having only a limited responsibility for complete medical care, we referred a certain number of employees to private physicians, dentists, and other community health facilities, as part of our extensive health counselling services. We therefore maintained close working relations with area physicians, not only maintaining their good will but also actively soliciting their cooperation to insure that the best possible medical care was given to their patients who are also our employees. Since work-related injuries and illnesses are treated under provisions of the Bureau fo Employees' Compensation, and private physicians are not generally directly involved, we also maintained up-to-date knowledge and competency in making the best possible referrals to appropriate government facilities. In all cases we attempted to choose that particular disposition which would be in the best interests of the patient.

3. Referral of normal employees to various clinical investigators who have requested our assistance continued as in past years. We welcomed these opportunities to refer employees, since it involved us, even though remotely, in clinical research. Projects which were most active during the past year included hypertension under Dr. Horwitz, NHLI; migraine headaches, also under NHLI; and herpes lesions and diabetes under NIAMD.

4. Work-related allergies to laboratory animal dust and danders continued to be significant and at times seriously incapacitating problems. Dr. Halla Brown, well known allergist from George Washington University, continued as our consultant spending one half day every two weeks with us. She was most helpful, not only quietly and competently working up cases we referred to her, but also offering desensitization treatment for work-related allergies.

PREVENTIVE MEDICAL PROGRAMS

1. The Inter-Institute Technical Committee on Biohazards under the Office of the Director was organized during the past year with the Chief, EHS, as one of its members. We welcomed the opportunity to serve on this Committee since it is expected that we will have greater opportunities to meet our obligations in the prevention and control of environmental health hazards. The formation of the Committee also indicates serious interest on the part of top level management so essential to achieve meaningful results in biohazards control. Working with management and supervisors, specifically with the NIH Safety Officer and engineers in the Environmental Services Branch, we attempted to be alert constantly for early signs of environmental health hazards.

We reported all suspected occupational injuries and illnesses which we treated to the Safety Officer for his follow-up. We were often the first group to observe untoward effects of environmental hazards, higher incidence of particular types of injuries occurring in certain areas, and other possible early signs or symptoms, or merely vague complaints, of suspected occupational disease. We considered the care of work-related injuries and illnesses as one of our primary responsibilities and continually encouraged our medical and nursing staff to remain alert for the early signs or symptoms which may suggest exposure to toxic chemicals or microbiological hazards.

The question of the method of handling medical surveillance in the control of biohazards is a difficult one. Whether to have a voluntary or involuntary

system of reporting all injuries and illnesses, of individuals participating in immunization and examination programs, etc., is indeed difficult to decide, if in fact, a mandatory or involuntary system would be legally enforceable. The philosophy over the years at NIH has been the traditional approach, a decentralized one wherein the laboratory Chiefs and responsible investigators were given direct responsibility for biohazards control, and participation in all surveillance programs was voluntary. We will await deliberations of the new Biohazards Committee to determine the best and most feasible method to follow in the future. Personally, our experience suggests that the mandatory system would not be any more successful, and would more likely merely raise the level of sophistication which employees would exercise in evading surveillance procedures designed for their protection.

2. During the year we significantly improved our capacity to provide occupational mental health services. Following an incident in the Bldg. 1 cafeteria, when a psychotic employee literally went berserk, our needs were more urgently brought to the attention of the Director, Clinical Center, who immediately supported our pleas for additional psychiatric consultants. We now have on board four part-time psychiatrists who will be spending by July 1971 a total of approximately 60 hours per week in our Department. We were particularly fortunate in having the NIMH Mental Health Career Development program assign Dr. Arthur Strauss to us for a two year period beginning July 1, 1971. Spending approximately one day per week at present, he will increase his hours to approximately 80% after completion of his psychiatric training at St. Elizabeth's Hospital. With Dr. Strauss and the other three part-time psychiatrists, who are presently with us, we hope to develop a comprehensive preventive medicine oriented mental health program, following community psychiatric practices rather than the traditional office oriented, one-to-one relationship of psychiatrist to patient.

Our psychiatrists will provide limited direct services to employees, so-called "crisis intervention," generally consisting of two or three interviews. We will also provide consultation to management through individual contacts with supervisors, administrators, and Personnel Officers, and will also conduct seminars for supervisors directed to better understanding employee emotional health problems. We will also organize and conduct group psychotherapy programs for particular mental health problems amenable to this therapeutic approach, working with and providing training to selected EHS nurses who will assist in the management of such group sessions. Alcoholism and drug abuse rehabilitation programs are examples of such problems which may be suitable for group therapy. Lastly the psychiatrist will provide formal and informal training to EHS physicians and nurses to assist them in responding more competently to employees with emotional health problems.

3. Significant advances were made in our alcoholism rehabilitation program. Two EHS nurses received specialized training at Hood College and both are scheduled for additional training, one at Massachusettes General Hospital for six weeks of intensive training, and the other for two weeks training at the Institute on Alcohol Studies, Rutgers University. Working along with our new Assistant Chief, Dr. Shaffer, who took an active interest in the problem of alcoholism, the nurses developed quite exceptional competence in administering our program. Highly successful group therapy sessions were held weekly and

Antabuse was given to selected individuals daily in the Employee Health Service. We were encouraged by the number of successes and estimate that more than 75% of individuals we saw were helped.

Our two nurse specialists met with Dr. Chafitz, new Director of the National Institute for Alcohol Studies, and discussed our programs and hopes for the future. We presented to Dr. Chafitz our need for a specially trained counselor in this area and expresses the hope that the new Institute might be able to help us in locating and obtaining a full-time counselor, perhaps as a pilot program within the Federal Government.

4. Indicative of increasing awareness on the part of top level management that safety and health are of vital concern to the overall NIH mission, two additional committees were formed during the past year: the NIH Coordinating Safety Council and the Hazardous Pay Committee. Dr. Shaffer, our Assistant Chief, as a member of both of these committees worked closely with other members to evaluate hazardous working conditions at NIH in an effort to devise new methods for corrective action, and to determine which positions at NIH may meet the requirements for hazardous pay differential. Whether or not reorganization of the Safety and Engineering activities will occur, or whether these activities could be better coordinated by committee action is not clear at this time. What is clear, however, is the fact that there is increasing awareness of the importance of improving the NIH safety record, which demands not only high level management interest, but also active participation on the part of all supervisors who must set the example for their employees.

The fact that unsafe physical conditions were responsible for only a limited number of injuries prompted us to undertake a study in cooperation with one of our psychiatric consultants on the human factors involved in accident prevention. It is well known that individuals bring to work home problems which adversely affect their performance and which could contribute to accidents and injuries. The study will hopefully uncover preventive medical techniques designed to minimize or control human factors in accident causation.

5. Anticipating the time when a certain number of the younger generation who are now experimenting with drugs will be applying for work at NIH, we developed guidelines during the past year which hopefully can consistently be followed in dealing with this serious problem. Efforts were made to obtain careful histories at the time of pre-employment examination, and whenever history of drug abuse in any form is uncovered, careful efforts were then made to determine whether or not the individual has been successfully rehabilitated. According to Civil Service directives, the successfully rehabilitated individual, whatever the nature of the disability or health problem may have been, is employable.

Individuals actively addicted, particularly to hard drugs, are not employable and not medically acceptable for any position at NIH. Many individuals, even those who had been addicted to the hard drugs, are now being successfully rehabilitated. These individuals, when their rehabilitation has been documented, should be given an opportunity to prove that they are able to work productively. Nothing can harm the successfully rehabilitated addict more than repeated failure in trying to obtain a job. It is, however, important to follow such individuals medically and we called them in at unannounced occasions for examination and

urine testing for the presence of drugs. Recognizing the drug problem realistically in this manner will hopefully enable us to avoid the mistakes which were made in handling the alcohol problem in past years, forcing the problem underground and making it extremely difficult to control.

6. An outbreak of diphtheria in San Antonio, Texas, during the year led to a great number of questions being asked regarding the need for diphtheria immunizations prior to travel to that area. Coincidentally, the question of diphtheria immunization was under study for employees with patient care responsibilities. At the present time the only diphtheria toxoid that is available for adults is combined with tetanus toxoid. We made a thorough search of all manufacturers and no one seems to be willing to package adult diphtheria toxoid alone. There are many occasions when tetanus toxoid is not necessary and it seems unfortunate that this additional antigen has to be given when it is not needed. The problem is further compounded by the fact that the Schick test is not considered reliable. Except in unusual circumstances therefore, when it is considered likely that an individual will have close intimate exposure to the resident population in San Antonio, diphtheria toxoid immunization does not seem to be warranted for the casual visitor to San Antonio.

The increased incidence of cholera in certain Southeast Asian countries led to many questions from individuals planning to travel to that area. CDC determined that the increased risk to the average American traveler is not great and that immunization probably is not warranted. However, to avoid delays and forced quarantine, EHS recommended a full course of cholera immunization, particularly if it is likely that the individual is stopping enroute, even momentarily, in a country in which any cholera is reported to exist.

As settled as the issue of poliomyelitis immunization would seem to be, we had rather frequent requests for polio immunizations. Because of the rare, although quite definitely increased, risk of acquiring paralytic poliomyelitis following ingestion of Type 3 oral vaccine, experts in DBS have advised against giving any oral polio vaccine to adults unless titers are first obtained. In the absence of any immunity to Type 3, polio virus, the injectable Salk vaccine should be given first, following which a titer should again be repeated. If the individual does not develop a titer to Type 3 virus, the oral vaccine should not be given. If he does develop titers to Type 3, or if titers are already present, then it is satisfactory to give the oral vaccine.

The presence of mumps in adults is always a rather emotional experience, particularly for some of the male contacts to an original case. A physician recently developed mumps, and titers were obtained on 25 contacts to this individual. The incubation period passed uneventfully and none of the 25 individuals developed mumps.

Immunizations for employees exposed to biological hazards continued, but generally only on request of the responsible investigators. All programs of this type are voluntary and we are well aware that many employees, who are not encouraged by their supervisors, do not avail themselves of this protection. Whether or not a mandatory system will be put into effect will depend upon recommendations of the new Biohazards Committee.

In view of the fact that an outbreak of influenza was not predicted for the past influenza season, influenza vaccine was offered only to those individuals with chronic health problems who might be seriously effected by an attack of influenza. Employees in general were not offered vaccine.

7. Planning was begun to offer tuberculin skin testing to all new employees at NIH. One of the major difficulties in providing tuberculin skin tests in the past is the fact that the tests must be read in 48 hours, and it has been virtually impossible for individuals to return to EHS 48 hours after they had a physical examination since on most occasions they are not yet on duty. In cooperation with the Personnel Officers, we planned to enable one of our nurses to be present in Bldg. 31 Personnel Department when large groups of employees are sworn-in and finger printed their first day on duty. Since they will be more readily available 48 hours thereafter, skin tests performed at this time are more practical. At that time the employee will be asked to report to the specific Health Unit in the area in which he works. This will serve an additional purpose by enabling the employee to become acquainted with the Health Unit in his particular area, hopefully resulting in more effective use of these outlying Health Units. With baseline tuberculin skin tests, we will be in a much better position to evaluate any possible exposures to tuberculosis which occur in the future, either as the result of contacts to active cases in fellow employees, sub-human primates, or patients.

8. Because of the importance of serious sequellae to strep infections, we took great interest in culturing all sore throats which came to our attention. With specific therapy in the form of penicillin available for strep infections, it was very important to obtain precise information as soon as possible to be able to provide specific and highly effective chemotherapy, and at the same time eliminate any heretofore unnecessary chemotherapy in the great majority of upper respiratory infections which are not related to strep infections. Following procedures which we developed over the years with the help of NIAID and the Clinical Pathology Department, we were able to obtain definitive results on our cultures within an 18 to 24 hour period following taking of the culture. The Microbiology Service of the Clinical Pathology Department recently reviewed our techniques and found them acceptable. They revised their own techniques which formerly required two or more days to submit a report to the requesting physician. Ironically, we were, in fact, following informal suggestions of the Clinical Pathology Department which they had not put into effect themselves, being satisfied to follow, for one reason or another, the older, more time-consuming traditional techniques.

9. Preventive measures for the control and surveillance of hepatitis were taken during the past year in cooperation with the Committee on Control of Infections in the Clinical Center. Guidelines were established for the administration of gamma globulin and the problem of disposition of Au antigen positive patient care personnel was carefully studied. Whether or not such individuals with positive tests, in the absence of clinical disease, pose significant exposure to patients can not be answered with certainty. It appeared that, as a minimum precaution however, individuals with positive Au antigen tests should be counselled by EHS regarding personal hygiene and should be requested to wear gloves when in direct contact with patients. The desirability of inaugurating

a surveillance program to include Au antigen tests annually is being considered for selected groups of patient care personnel with intimate exposure to blood and blood products.

10. Our tuberculosis control and surveillance program continued to be active. Not only did we attempt to increase our tuberculin skin testing coverage to include a baseline skin test on all new employees, and repeat tests on all Clinical Center employees, but the possibility for making such tests for hospital employees mandatory is now being considered. Following an outbreak of tuberculosis on Capitol Hill last summer, an extensive isoniazid chemoprophylaxis program was instituted. Extensive press coverage was given in November 1970 to two fatal cases of hepatitis in staff who had been receiving INH. The Center for Disease Control thoroughly investigated the cases and could not eliminate the possibility that INH could have been involved in the fatal cases of hepatitis. We considered it prudent to advise all of our own employees who were on INH to discontinue therapy pending the outcome of the study. Therapy for converters was resumed with the provision that liver function tests be obtained monthly at the time INH prescriptions are refilled.

11. Health education movies were shown bi-monthly as in the past. Subjects ranged from alcoholism to pre-retirement counselling, the latter covered by a movie "The Rest of Your Life" which attracted over 500 individuals to the showing, accounting for one of our best attended movies of the year. As part of our pre-retirement counselling activities, we worked closely with the Employee Relations Branch of the Office of Personnel in pre-retirement counselling and assisted them in arranging seminars on this subject.

12. Over ten years ago we conducted an extensive cancer detection program, providing more than 3000 cervical cytology examinations for NIH women employees. The program at that time was part of an NIH study which validated the effectiveness of cervical cytology in the detection of cancer of the cervix. We have been long overdue in repeating a program of this kind and are now making preliminary plans to offer once again cervical cytology examinations. To better utilize our outlying Health Units and to minimize space difficulties in the Bldg. 10 Health Unit, we plan to use the Bldg. 37 Health Unit for this program which we hope to inaugurate mid 1971.

13. Encouraged by the Director, CC, we attempted to recognize the role we can play in conducting limited clinical research, utilizing the vast "captive audience" which we have in the employee population. There is urgent need to learn more about the incidence of Au antigen positive individuals in a hospital environment. We indicated a willingness to cooperate in such a study which would include obtaining Au antigen blood levels on approximately 3000 NIH staff members. A program of this magnitude would require extra personnel and we proposed that medical students be used for this purpose.

Following Dr. Linus Pauling's highly publicized book extolling the virtues of Vitamin C in the cure and prevention of the common cold, one of our Associate Medical Officers carefully reviewed the literature on Vitamin C and the common cold and prepared a detailed protocol for a clinical study of the effectiveness of Vitamin C in the cure and prevention of the common cold. Feasibility studies are now being conducted to determine whether or not the study will be undertaken.

500 questionnaires will be sent to randomly selected NIH employees who will be asked to respond to the questionnaire. Information will be obtained on the number of colds experienced during the past year and an indication of interest in participating in the study. Many inquiries from the press were answered regarding our involvement in a Vitamin C study, most of which we were able to handle independently without too much difficulty. NIAID scientists, both in basic virology and biostatistics, were very helpful to us in developing the protocol.

ADMINISTRATION CONSIDERATIONS

1. In spite of personnel ceilings, our staffing patterns were considerably improved over the previous year with the possible exception of our clerical area. Even here, however, with the substitution of a part-time clerk for one of the full-time positions which we lost, and with an afternoon high school student, we were able to meet our clerical needs in a reasonably satisfactory manner.

On the plus side we are pleased to report that Dr. George Shaffer joined the staff early in the year as our new Assistant Chief, and he has already become a highly respected and productive member of our staff. We are looking forward to one of our new Junior Medical Officers who will report in July, who has had interest and rather extensive experience in applying electronic data processing methods to records management. We recognize this as one of our weak areas and expect to improve our records significantly.

2. In an effort to improve not only our records keeping, but also our overall clerical functions, we considered the feasibility of preparing addressograph plates for all employees and utilizing them primarily for preparing X-ray and laboratory requisitions. We were in part encouraged to prepare these plates by the X-ray Department who is insisting that all X-ray requisitions be prepared with plates rather than hand written. Several technical problems need to be solved before we can convert to addressograph plates, but the advantages appear to outweigh the problems as we now see them.

3. Recently our Junior Medical Officers were added to the list of Clinical Center O.D.s in view of the fact that one of the primary responsibilities of of the M.O.D. is the care of employee illnesses and injuries occurring when the Employee Health Service is closed. No serious difficulties arose in conjunction with this additional duty, although both of the Junior Medical Officers have commented that the patient load while on duty is extremely light. It was difficult for them to sense the real value of their presence, except for the possible psychological effect of demonstrating that the Clinical Center is accepting its share of the M.O.D. load.

4. Staff members participated in supervisory training courses conducted by the Personnel Office. The Chief, EHS, served as Chairman of the CC Combined Federal Campaign. Our technologist provided vena puncture instruction to Clinical Center Nursing staff. The Chief, EHS, served on the Post Office Advisory Committee, evaluating hazardous properties of materials sent in the mails. Our psychiatric consultants cooperated with the Personnel Office in the organization and conduct of Mental Health Seminars for Supervisors.

5. Staff members attended various conferences and participated in committees of professional organizations. The Chief, EHS, attended the Industrial Medical Association meeting in Atlanta, Ga. and the Industrial Hygiene Foundation meeting in Pittsburgh, Pa., serving as a member of the Board of Directors of the Occupational Health Institute and the Long Range Planning Committee and the Evaluation Committee of the Industrial Medical Association. The Assistant Chief, EHS, attended an intensive one-week seminar for Occupational Health physicians at the Menninger Clinic in Topeka, Kansas. Two of our staff nurses attended the American Association of Industrial Nurses annual meeting in Atlanta, Ga. One of our Associate Medical Officers attended a 3 day course covering cardiac arrythmias. One nurse attended a course in Occupational Mental Health, sponsored by the Division of Occupational Health and Safety, in Cincinnati, and another attended an intensive six week highly specialized course in alcoholism rehabilitation at the Massachusettes General Hospital.

6. Although previously recorded in last year's annual report, little or no progress was made in the improvement of two of our outlying Health Units. The Westwood Health Unit continued to have no heating or cooling of the air supplied to it. The only air supply to the Health Unit, which was originally designed as storage space, is air directly from the outside. The basement room therefore becomes uncomfortably cold in the winter and unbearably warm in the summer. We had many promises that the condition would be corrected by the building owner, but to date there has been no action. The other Health Unit, where the conditions are also unsatisfactory, is in Bldg. 37. Once again we hoped that the serious noise and vibration problem would be corrected by replacing poorly engineered equipment in an adjoining steam valve room. After considerable delay, we eventually were notified that such a renovation would be excessively expensive and that the plan would have to be abandoned. No alternative engineering solution seems to be possible and we have requested that efforts be made to relocate the Health Unit.

Table 1
Selected Statistics

General	FY1971	1970	1969	1968
Total visits	25,560	23,629	24,432	25,787
Visits for occupational injuries and diseases	2,475	1,980	2,089	2,506
Immunizations	5,850	10,340	10,162	9,344
Pre-employment physical examinations	1,423	1,236	1,321	2,688
Laboratory examinations	16,652	14,587	16,486	18,329
Referral to personal physicians	973	1,342	1,478	1,591

Staff				
Physicians	4 2/3	3	3	3
Nurses	11	11	11 1/2	11 1/2
Clerical	3 3/4	2	4	4
Laboratory	2	2	2	2

July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

ENVIRONMENTAL SANITATION CONTROL DEPARTMENT

CC-06
Serial No.

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PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
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PROGRAM GOALS

The goals of Environmental Sanitation Control Department (ESC) during FY 1971 were an extension of the goals of the previous year:

1. Provide a bacteriologically and physically safe, comfortable, and aesthetically pleasant environment within the Clinical Center for patients, staff, and visitors.

2. Provide opportunity for all employees to seek and achieve their highest potential.

3. Strive to upgrade and standardize cleaning performance in all areas.

4. Test new products and equipment to utilize most modern housekeeping practices.

5. Train all supervisors and laborers to perform economically and at a high level.

6. Participate in the selection of textiles and fabrics for draperies, furniture, wall and floor coverings which were fire safe, functional, and in keeping with interior decor of today.

7. Foster cooperation of departments and institutes in the Clinical Center in the new in-depth environmental programs.

8. Update the Development and Training Section's functional statement and name to more clearly indicate its actual responsibilities and capabilities.

9. Develop a job description for a technician position in the Development and Training Section.

10. Provide assistance, support, and consultation in the promotion, coordination, and utilization of environmental health services furnished or potentially available to the Clinical Center

11. Identify and evaluate potentially hazardous environmental conditions and implement applicable corrective measures consistent with both available resources and priority rating.

12. Conduct limited technical environmental studies consistent with

available departmental resources.

13. Promote, implement, and coordinate increased environmental health and safety training to institutes and departments within the Clinical Center.

14. Disseminate institutional environmental health information to hospitals, government agencies, and interested individuals via oral and written channels.

15. Implement the A. T. Kearney management consultants' recommendations.

Sections of the department expanded their efforts to implement those goals to make them fully operational. This was accomplished as personnel and funds permitted.

PROGRESS ACHIEVED

Administration

The Operations Section felt the beneficial impact of upward mobility programs this fiscal year. Since most employees reach the top pay step of the Journeyman Housekeeper in about two years and are at a "dead end" with almost no promotion opportunity to leader or supervisory grades, Operations Section personnel were predominately in the target group for Equal Employment Opportunity programs. Section management made positive efforts to assure that employee skills were fully utilized and that opportunities were provided for employees to enhance their skills so that they might advance in accordance with their abilities. Through extensive counselling efforts each employee was encouraged to enhance his skills to the highest level of ambition and ability and to explore new career fields with greater potential for upward mobility.

Basic Adult Education programs comprised a major part of the Section's employee development effort. Operations Section had an average of 12 employees enrolled in Basic Adult Education programs throughout the fiscal year for a total of 1,815 man-hours. An additional 12 employees requested enrollment in Basic Adult Education plans and were scheduled for placement when classroom and teachers become available.

Operations Section personnel actions were impressive. One hundred ninety-four applicants for employment were interviewed. Of these, 103 or approximately 53 percent were offered employment. Sixty-four new employees actually came to work in the Section. Sixty percent of the new employees were female and at year's end the workforce was almost exactly balanced between male and female employees. Employee departures from the Operations Section almost tripled over those for fiscal year 1970. Sixty-four employees left the section. Of these, thirty-four, or slightly more than half, remained at NIH in positions with better promotional opportunities.

Special efforts were also made to locate and offer employment to

disadvantaged minority groups in the local community. As a result the section hired two Latin Americans with little or no English speaking ability and they were successfully integrated into the workforce.

Five Operations Section employees were lost during the fiscal year because of deaths.

Eighteen Operations Section employees, approximately ten percent of the workforce, were nominated for Sustained Superior Performance Awards during the fiscal year.

Nineteen employees received Length of Service Awards totaling 250 years of satisfactory Federal service.

Letters of appreciation were presented to two employees with perfect attendance and sixteen employees with outstanding attendance during calendar year 1970. To achieve perfect attendance the employee must have used no sick or unplanned annual leave and have always signed-in on time. Outstanding attendance was defined as not more than three sick or unplanned absences during the year.

One Operations Section employee, Mrs. Columbia Jackson, received a cash award for two beneficial suggestions. One suggestion was for a mop holder to be installed on the maid's cart to provide a means for carrying the treated dust mop. The other suggestion was a design for storage of large plastic bags in the gear room.

Six Operations Section employees were named to a committee to submit recommendations for enhancing the locker rooms used by Operations Section personnel. The committee recommendations resulted in approval of repainting and new furnishings for the locker rooms.

Operations Section inaugurated a monthly newsletter, "O.S. NEWS," in February. The newsletter's purpose was to improve communication among the section's units, increase employee awareness of co-worker and section accomplishments, training opportunities, and items of general interest.

New position descriptions were developed and submitted for entrance level and journeyman janitors.

Significant progress on, and acceptance of Development and Training Section's approach to Clinical Center environmental control was achieved in FY 1971. Better understanding, cooperation, and communication were brought about with the Environmental Services Branch through more frequent and open discussions. Improved relationships were actively promoted and obtained from the Office of the Director for Administration, NIH which includes Biomedical Engineering, Plant and Safety Management, Insect and Rodent Control Unit, Plant Engineering, and Engineering Design Branch.

The Nursing Department - ESC Liaison Committee continued to function smoothly. Meetings were held monthly to discuss interrelated problems

and to cooperate on research activities of mutual interest.

Development and Training Section continued to serve on the National Cancer Institute, Medicine Branch, laminar flow work study group in a consultant capacity. Section suggestions that the institute retain a microbiologist for environmental control developmental work was accepted. This resulted in a significant reduction in section staff manhours spent on the project. Hence, efforts were re-directed towards other immediate Clinical Center problem areas.

Monthly environmental control meetings of the Health Services and Mental Health Administration were attended in the Parklawn Building, Rockville. The sessions were highly productive in that channels of communication developed which made it possible to exchange and discuss items of mutal concern in environmental control within a medical care institution.

The A. T. Kearney and Company management consulting firm completed its evaluation of ESC and recommendations were studied and departmental changes were partially made. It is planned to make additional changes as personnel, funds, and space become available.

Environmental Activity

In FY 1971, Development and Training Section implemented a broad in-depth environmental control program within the Clinical Center. Major emphasis was directed toward food service, electrical safety, insect and rodent control, plumbing, housekeeping, microbial contamination, and general sanitation. Three patient areas and all Nutrition kitchens were inspected and appropriate work requests or action instituted for correcting identified problems.

A physical plant inspection of building 10A was completed in conjunction with the Maintenance Inspection Unit, Plant Engineering Branch (PEB), and assisted by the Nursing Department, Clinical Center. Subsequently, a report was prepared which resulted in a PEB request for bids to correct most deficiencies. Some items were found to be inherent structural problems with a remote possibility for permanent correction.

Building plumbing continued to be investigated in order to identify potentially hazardous conditions. Implementation of a corrective plan of action was commenced and appropriate work requests submitted.

A search for a deodorant device that could safely and effectively be used in odiferous building areas was successful. The odor control units met the requirements with regard to appearance, noise levels, space requirements, and odor masking capacity and received staff and patient approval.

Progress continued on improving sanitation in animal rooms located within the Clinical Center. Support for the program was obtained from the Clinical Center Director, the Division of Research Services, and most of the Institute Administrative Officers.

Significant improvements in building insect and rodent control have emerged as a result of the cooperative working relationship developed between Development and Training Section and the Insect and Rodent Control Unit, Office Services Branch.

An environmental survey of the NIH laundry, tunnel, and incinerator in fiscal year 1971 resulted in a comprehensive report that called for major improvements. Corrective steps were started to resolve the deficiencies; however monetary deficiencies prevented complete implementation of the recommendations.

All building freight elevator lobbies were inspected for safety and sanitation in conjunction with the Protection and Safety Management Branch. A detailed report was prepared and recommendations made for improving existing conditions. Where appropriate, work requests were prepared and routed to Plant Engineering Branch for action.

A noise survey of the Medical Records Transcribing Room was conducted in an attempt to evaluate the effects of carpeting in reducing noise levels produced by typing. Before and after measurements obtained disclosed that carpets did not significantly reduce the generated sound levels.

Plastic or rubber waste containers used in the Clinical Center precipitated an investigation as to the potential fire hazards resulting from their use. Actual in-use fire tests, conducted in cooperation with the NIH Fire Department, indicated that rubber or plastic units were not safe. As a result, metal containers with "cease fire" tops were purchased for evaluation. To date, highly favorable comments have been received on the containers.

Cold steam humidifiers were studied to determine methods to prevent, reduce, or eliminate microbial contamination in the water reservoir during use. One possible approach was evaluated and subsequently accepted by industry for further investigation and implementation. Highly satisfactory progress has been obtained with the proposed concept, and as a result, one significant source of patient contamination may soon be eliminated.

Production Improvements and Operational Activities

The operating suites in 10A and the Clinical Center began converting their power scrubber natural fiber brushes to the synthetic type developed by Development and Training Section. This should result in a significant improvement in the machine cleanliness level.

Through the combined study efforts of both sections it was possible to promote "selective" painting of Clinical Center areas rather than a blanket approach. Significant NIH saving in money and manpower may be realized by this approach.

Slight modification in the floor vacuum cleaners, whereby plastic bags were installed, resulted in less time to empty soil and reduced the potentially

hazardous microbial aerosols generated during the emptying procedure.

Operations Section evaluated a new 32" battery powered floor scrubber. The machine demonstrated several advantages over the present machines: better maneuverability, simpler control, greater solution capacity, higher efficiency vacuum exhaust filters, and better solution pick-up. Sound levels measured by Development and Training Section were shown to be roughly equal to present equipment.

Operations Section studied the feasibility of gravity hand soap dispensers in Clinical Center public restrooms. A gravity soap dispenser was installed in a public restroom and after correction of initially faulty installation, the system was trouble free. Initial expense was high, but operational expense for servicing and maintenance was negligible. It was concluded that a gravity system is preferable in high-use public restrooms with at least four lavoratory basins per system.

Operations Section obtained two model 51 floor polishing pads from 3M Company for a two week evaluation. Studies showed that there was no significant difference between the new pads and the present, less expensive, floor machine pads.

Operations Section, with technical assistance from the Development and Training Section, evaluated an "Automop" for possible replacement of the traditional wet mop in cleaning operations. The Section found the basic idea good but the particular machine was found unsatisfactory for use in general housekeeping operations in the Clinical Center because of excessive noise [110 dB (A) at the machine and over 80 dB (A) in the patient corridors] design defects and high cost without sufficient offsetting labor saving. Other manufacturers are working on development of similar equipment which will be studied as they are marketed.

Operations Section tested another new method for wet mopping floors. This mopping system made use of a wet slip-on dust mop, the ESC Wall Mop Wringer and a standard two-bucket mopping unit. The employee used the mop in the same manner as a dry treated dust mop. The method was found to be less tiring than conventional wet mopping. Time requirements were about equal. The quality of cleaning was satisfactory in lightly soiled areas; however, floor streaking was noted in heavily soiled areas. The method looked promising for areas with light floor soiling and for employees less physically able to handle the conventioanl wet mop. The major constraint on wider implementation of this method was lack of availability of sufficient ESC Wall Mop Wringers.

The Section inaugurated some operational changes in elevator procedures in order to improve service. Elevator #14 service was extended from 6:30 p.m. to 12:15 a.m. on week nights. This provided opportunity for OD's and other personnel on the west end of the building to have transportation during evening hours. Elevator cars #3 and #4 were designated to provide express service Monday through Friday 8:00 a.m. to 5:15 p.m. for the 7th through 14th floor passengers. Cars #1 and #2 continued to provide local service.

These changes, coupled with intensive training efforts to upgrade elevator operator performance and efficiency, improved elevator operations considerably.

The Operations Section made a four month study of the necessity of having water in cigarette wall urns. The study consisted of leaving all cigarette wall urns dry on the second floor and making frequent observations for problems or complaints due to odor, smoke or fire emanating from the wall urns. No problems were observed or reported during this period. As a result of the study, all cigarette wall urns above the first floor of the Clinical Center are now maintained dry.

Operations Section actively provided assistance to Clinical Center occupants in specification of carpeting meeting Hill-Burton standards of flammability. During the year Government Services Administration placed three carpets on contract schedule that met the Hill-Burton requirements but not necessarily the strict requirements of the Clinical Center on smoke production. The Department's letters to GSA were largely responsible for the industry and GSA making available safe carpeting for hospitals. Operations Section assistance to Clinical Center occupants buying carpeting consisted of providing samples of Clinical Center approved carpeting, measurements of areas to be carpeted, assistance in preparation of requisitions, and assistance in scheduling and coordination of installations. The Section provided assistance in 27 such projects during the year.

TRAINING

In the Operations Section the overall manhours devoted to training increased by almost 285 percent over fiscal year 1970. The bulk of this increase was shown in the 1,815 manhours for Basic Adult Education classes and the 2,796 manhours for training in basic work procedures. Other training activities showed no unusual changes.

The NIH Laundry Section Chief has requested and received ESC assistance in their employee training program. Development and Training Section has been locating and previewing visual aids for potential laundry employee training.

Mr. Strong, Chief, Development and Training Section, attended a two week training course on "Industrial Health Measurements" in Cincinnati. Mr. Musachio, Sanitarian of the Development and Training Section attended the National Environmental Health Association 34th Annual Educational Conference in Las Vegas. Mr. William Lomax, supervisor in training with Development and Training Section attended an NIH in-service biology course, four hours a week for sixteen weeks. Development and Training Section personnel attended a one day seminar on Hospital Electrical Safety in Philadelphia.

The Mount Sinai Hospital electrical safety program in Baltimore was visited and discussed. Considerable information was obtained for use in the Clinical Center program.

Two Seminars on "Infection and Control" were attended by Section personnel. The sessions were presented by Dr. Graham Ayliffe, Hospital Infection Research Laboratory, Summerfield Hospital, Birmingham, England and Dr. O. M. Lidwell, Cross-Infection Reference Laboratory, Central Public Health Laboratory, London England, authorities in infection control.

The chief of the department attended the International Conference on Nosocomial Infections at the Center for Disease Control.

Chief, Development and Training Section attended a two day task force meeting on "disposal of Hospital Disposables," sponsored by the National Sanitation Foundation.

PUBLIC RELATIONS

The department provided on-the-job training and orientation in housekeeping and environmental sanitation for one trainee from the Hannah Harrison School, Washington, D. C.

Chief, Development and Training Section visited Caracas, Venezuela as an advisor with the World Health Organization, Pan American Sanitary Bureau for one week to evaluate their environmental hospital system and establish a training program in the United States for Venezuelan teachers in environmental control.

Other environmental control consultation was provided Walter Reed Army Medical Center, Columbia Hospital, Monsanto Chemical Company, New York State Health Department, World Health Organization, Public Health Service Hospitals, Edgewood Arsenal, Indian Health Service, Environmental Control Administration, and American Hospital Association.

The Department assisted in a Nursing Department Workshop designed to acquaint the Clinical Center head nurses with our program and available resources. The session was highly productive and successful.

Publications

Musachio, M. B., and Strong, C. D.: Vacuum scrubbers. Hospitals 44:90-93, 1970.

Spence, H. W., and Gamble, G. C.: Case history of an unsafe electrical plug. Exec. Housekeeper 17:29, 1970.

Spence, H. W., Gamble, G. C., and Tipton, H.: Designing a new wall-washer. Exec. Housekeeper 17:56, 1970.

Goldmintz, D., Musachio, M. B., and Hart, L. J.: Comparison of blood agar to other media for the recovery of microorganisms from surfaces cleaned with a phenolic germicidal detergent. J. Industr. Microbiol. In press.

The Department completed revision on the "Handbook for Employees of the

Clinical Center's Environmental Sanitation Control Department."

New cleaning procedures were developed for "The Dry Cleaning of Carpets" and for cleaning of patient protective "Laminar Air Flow Units."

Presentations

A one hour session of "Environmental Control in Institutions" was presented at Columbia University by Mr. Musachio to institutional sanitarians from a tri-state area.

A two hour session on "Environmental Control in Housekeeping" was presented to the National Executive Housekeeper Association's Educational Conference at the University of Maryland, by Chief, Development and Training Section.

PROBLEMS

Space

1. The Development and Training Section continued to have a critical need for space to evaluate cleaning equipment and materials, develop environmental sampling techniques, demonstrate developed prototype ideas, and process samples before sending them to the laboratory. In FY 1971, the corridors and gear rooms were used for testing and demonstration. This created safety hazards, noise problems, and inconvenience to Clinical Center patients, staff, and visitors. Testing procedures in public areas attracted people, thus creating delays and safety hazards. One module (250 $ft.^2$) located on the first floor was requested to carry out program responsibilities.

2. The loss of one-half of the Development and Training Section office space was a serious set-back to continued growth, especially at the time when significant program progress and support had been noted.

3. The loss of Operations Section supply room and storage space will reduce the operational efficiency of the program.

Personnel

1. The increasing Operations Section workload, erosion of position ceiling, and non-productive programs combine to create a lower level of cleanliness in the Clinical Center.

2. Operations Section continued to waste manhours because it is unaware of proposed dates for construction and renovation of projects. If construction and renovation schedules were available, work could be scheduled so no major cleaning would be done in an area that is about to be closed for construction or renovation and the Section could intelligently plan to prepare areas for occupancy.

3. The threat of downgrading of laborers has created an employee morale problem of serious dimension.

4. The Development and Training Section received an increased number of requests for environmental service this past year; however, personnel ceilings limited further growth and activity. An Environmental Health Technician is required and recommended by the management consultants to conduct non-technical sanitary surveys, investigate sanitary conditions or problems, implement control measures, collect samples, and perform basic sanitary tests thus enabling the professional staff to concentrate on more highly technical problems.

Hazards and Production Slowdown

The time delay between identification of potential hazards and final resolution continued to be excessive. In several instances, there have been delays from a few months to several years in correcting problems. This time lag may hopefully be minimized with improved liaison and understanding between concerned groups.

Reduced Development and Training Section morale and subsequent production slowdown has resulted from the inability to interest certain NIH groups in understanding or accepting the importance of potentially hazardous conditions revealed through our in-depth environmental surveillance program.

Miscellaneous

Employee locker rooms need to be air conditioned.

PLANS FOR FISCAL YEAR 1972

ADMINISTRATION

Personnel

1. Seek approval for a technician slot for the Development and Training Section, develop a job description, and select an employee.

2. Develop improved communication and understanding between this Department and the Plant Engineering Branch, Environmental Services Branch, Insect and Rodent Control Unit, Biomedical Engineering and Instrumentation Branch, Office Services Branch, Clinical Center Executive Office, and other groups concerned with environmental control.

3. Support and encourage upward mobility of employees so that they may work at their fullest potential.

Space

1. Continue to document and request a minimum of 250^2 ft work space for Development and Training Section.

2. Request improvement of the present overcrowded arrangement for the Development and Training Section.

3. Request adequate space for the Operations Section supply room and for storage of supplies and equipment.

Technical Services and Environmental Activity

1. Continue to implement the broad in-depth environmental control program within the limits of staff, work space, and funds. Items of primary concern will include (but not be limited to) pest control, solid waste, plumbing, food service, laundry, electrical safety, environmental microbiology, plan review of new construction, and general sanitation.

2. Provide technical consultation and service in laminar flow studies, new construction or renovation, animal room sanitation, pest control, and limited intramural and extramural training. These services will be of utmost value in raising the general sanitation level within the building.

3. Publicize study results in appropriate journals, books, and meetings.

4. Conduct special contamination control studies on equipment and supplies used in Anesthesiology, Inhalation Therapy, Housekeeping, Nursing, and Nutrition Departments.

5. Participate as an active member of the National Sanitation Foundation Committee which is developing standards for inhalation therapy equipment.

Production Improvement

1. Continue to test new products and equipment in order to utilize the most modern housekeeping practices.

2. Assist in coordinating environmental services provided the Clinical Center to prevent unnecessary duplication of effort and to obtain the maximum amount of available service.

3. Reevaluate the present environmental surveillance procedure in order to reduce paper work, improve communications through channels, and reduce manhours required per nursing unit survey.

4. Search for equipment, products, and methods that will improve productivity, sanitation, and safety conditions within the building.

5. Complete revision of "Clinical Center Cleaning Procedure Manual."

6. Develop and implement an Appearance Level Program to provide an objective numerical index of cleanliness in the Clinical Center.

7. Develop, train, and activate a project cleaning unit.

8. Continue major efforts to upgrade and standardize work procedures.

9. Continue in-use tests of new products and equipment in order to utilize the most modern housekeeping practices.

10. Coordinate the selection of textiles and fabrics for draperies, furniture, and wall and floor coverings within the Clinical Center.

Training

1. Continue to provide limited training on environmental control methods to personnel from other departments, institutes, agencies, and organizations.

2. Attend technical courses on environmentally related subjects such as planning, management, statistics, industrial hygiene, and microbiology.

3. Attend professional, educational conferences, and other meetings where the subject matter will be of value to the Clinical Center.

4. Complete refresher training and certification in basic work procedures for all section supervisors, leaders, and employees.

TABLE 1

DEPARTMENT OF ENVIRONMENTAL SANITATION CONTROL
April 1, 1970 through March 31, 1971

Formal Training - Classroom

Government	Man-Hours
National Bureau of Standards Work Shop	56
Job Element Appreciation	6
Training Institute for Equal Opportunity	28
Supervisory Management	48
Introduction to Supervision	240
NIH Advanced Course for Supervisors	120
Telephone Techniques	47
Refresher Typing	20
Refresher Shorthand	20
Bomb Threat and Search	7
Human Relations Work Shop	24
Adult Basic Education	1,815
Industrial Health Measurements	80
Biology Course	64
TOTAL	2,575
Seminars and Lectures	
Non-Government	
National Environmental Sanitation and Maintenance Conference	32
International Conference on Infections	28
National Association of Sanitarians 34th Annual Educational Conference	75
Seminar on Hospital Electrical Safety	16
TOTAL	151
Within the Department (O.S.)	
Certification of Employees	66
Procedures	2,796
Orientation	67
Supervisory Training	141
All Employee Training	671
TOTAL	3,741
GRAND TOTAL	6,467

TABLE 2

POSITIONS FILLED BY RECRUITMENT

DEPARTMENT OF ENVIRONMENTAL SANITATION CONTROL
OPERATIONS SECTION

April 1, 1970 through March 31, 1971

MONTH	WG-4 and above	WG-3	WG-2	WG-1	GS-2 and above	Total
April						0
May				3		3
June				21 *	2	23
July				1		1
August		1		4	2	7
September				2		2
October				9		9
November				7		7
December				8		8
January				2		2
February				0		0
March				2		2
TOTAL		1		59	4	64

* Three summer aides not included in total.

TABLE 3

NUMBER OF SEPARATIONS, RESIGNATIONS, ETC., BY MONTH & GRADE

DEPARTMENT OF ENVIRONMENTAL SANITATION CONTROL
OPERATIONS SECTION

April 1, 1970 through March 31, 1971

MONTH	WG-4 and above	WG-3	WG-2	WG-1	GS-2 and above	Total
April		5				5
May		6				6
June		7	2		1	10
July		6	2	3	1	12
August				3		3
September		3		6		9
October		5	1	2		8
November		1		1		2
December		1			1	2
January				2		2
February		1	1			2
March		1		2		3
TOTAL		36	6	19	3	64

TABLE 4

REASON FOR PERSONNEL LEAVING

DEPARTMENT OF ENVIRONMENTAL SANITATION CONTROL
OPERATIONS SECTION

April 1, 1970 through March 31, 1971

RESIGNATIONS	TRANSFERS	RETIREMENTS	TERMINATIONS	DECEASED
Resigned when faced with possible disciplinary action 5	Improved career opportunities 24	Retirement disability 1	Failure to report to duty 1	Death 5
To accept Federal Position 2	Monday through Friday 5	Voluntary retirement 2	Expiration of temporary appointment 1	
To seek other employment or to accept non-Government position 5	Clerk-typist training 5		Separation during probationary period 1	
To enter Military service 1	Military furlough 1			
Return to school 3				
Transportation 1				
Health 1				
Sub-totals 18	35	3	3	5

TOTAL - 64

CHART I

ENVIRONMENTAL SANITATION CONTROL DEPARTMENT

POSITIONS FILLED BY THE MONTH

April 1, 1969 through March 31, 1971

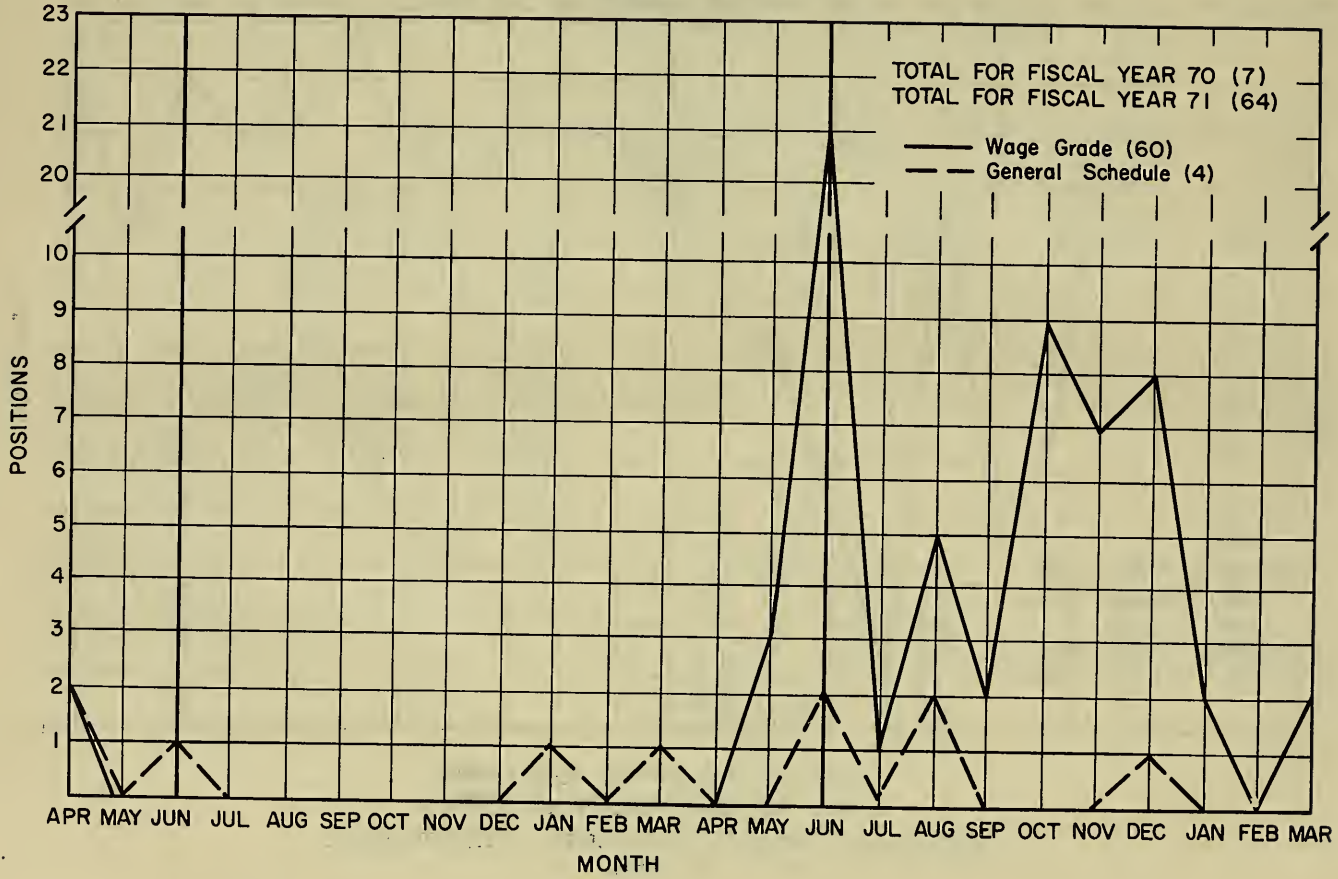


CHART 2
ENVIRONMENTAL SANITATION CONTROL DEPARTMENT
NUMBER OF SEPARATIONS BY MONTH
April 1, 1969 through March 31, 1971

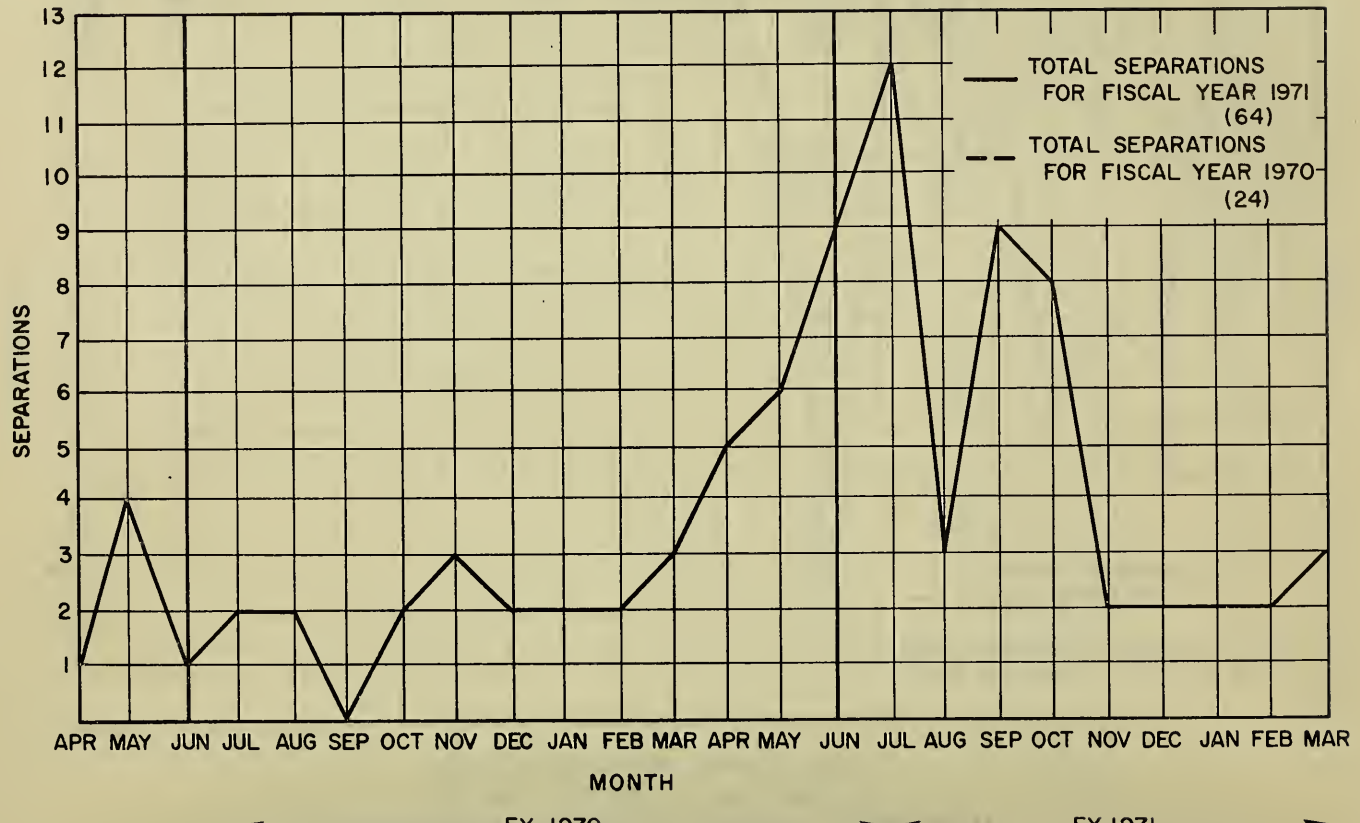
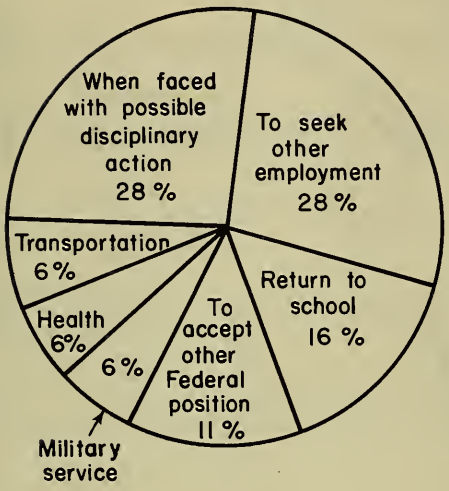
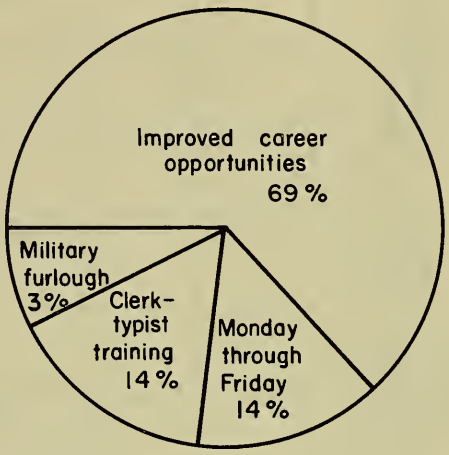


CHART 3
ENVIRONMENTAL SANITATION CONTROL DEPARTMENT
REASON FOR PERSONNEL LEAVING
April 1, 1970 through March 31, 1971

RESIGNATIONS – 18


When faced with possible disciplinary action 28 %
To seek other employment 28 %
Return to school 16 %
To accept other Federal position 11 %
6 %
Military service
Health 6%
Transportation 6 %

TRANSFERS – 35



OTHER SEPARATIONS – 11

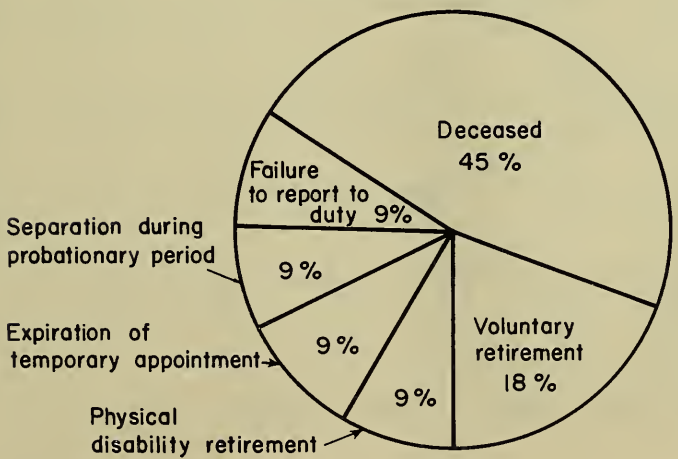
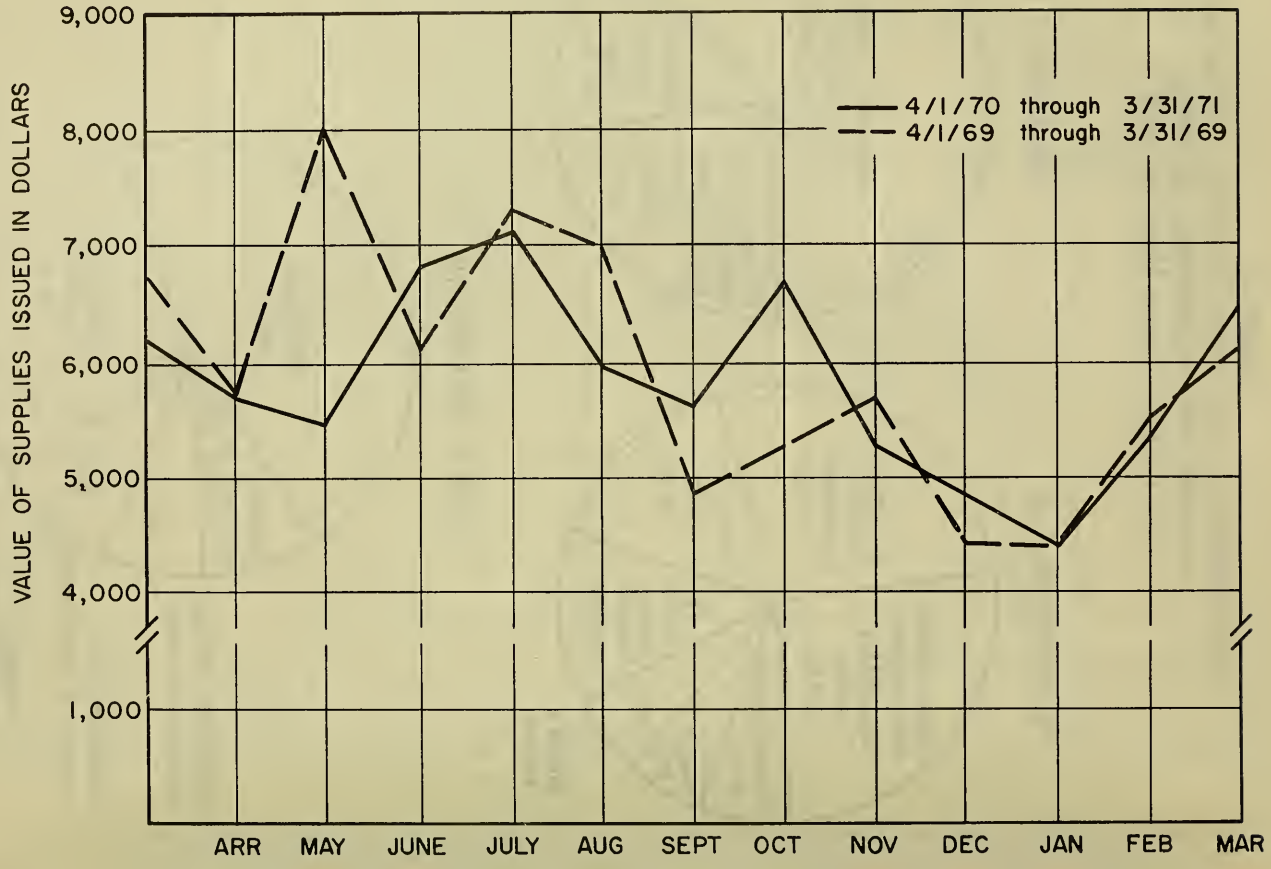


CHART 4

ENVIRONMENTAL SANITATION CONTROL DEPARTMENT

VALUE OF SUPPLIES ISSUED BY MONTH

April 1, 1969 through March 31, 1971



ES-20

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

MEDICAL RECORD DEPARTMENT

CC-27
Serial No.

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PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

MEDICAL RECORD DEPARTMENT

CC-27
Serial No.

OBJECTIVES

The Medical Record Department provides a medical record for every registered Clinical Center patient; the prime objective is to insure that each medical record is complete, accurate, safeguarded and available. To this end systems are maintained which provide: (1) an accounting of each registered Clinical Center patient; (2) immediate access to and release of medical records and information to authorized users; (3) a computerized listing of each patient by diagnosis and operation; (4) an analysis by Institute and Branch of discharged inpatients; (5) patient care statistical data compilations; (6) a systematic arrangement of reports within the medical record; (7) a record of dictation received and transcribed medical reports that have been dispatched.

MAJOR PROGRESS

Education and Training

Orientation of new employees from this and other Clinical Center Departments and from the Institutes was accomplished. Lecture tours continued to be given to the Public Health Service student medical record librarians and other visitors to the Clinical Center.

Key personnel attended seminars and meetings on subjects relating to medical record systems and procedures, data processing, office equipment, medical subjects and supervision.

A draft of new job standards was established by the Civil Service Commission for selected employees who may lack formal education as an Accredited Record Technician as well as for those who are Accredited Record Technicians.

Personnel

The number of employees on duty from July 1970 through March 1971 averaged 54; of this number, an average of 12 served on a part-time basis.

DEPARTMENTAL ACTIVITIES

The Medical Record Department continued to maintain and improve the standards of service it rendered to the Clinical Center in particular and to the National Institutes of Health in general. Therefore, it was necessary to estimate, appraise and execute systems and procedures and, concurrently, maintain an adequately trained staff to program these efforts.

The Dictaphone Corporation Pilot Study using centralized dictating equipment began 7-16-70 and ended 9-22-70 with negative results. It was discovered that the doctors did not follow the proper instructions for operation of equipment and the Medical Record Department could not maintain 24-hour coverage. The Clinical Center, therefore, reverted to decentralized system of medical dictation on 9-22-70.

Stage I of the massive coding project was completed; that is, all discharges for the period from January 1962 through April 1969 were coded for all Institutes. Stage II which consists of discharges from April 30, 1969 to December 1970 was completed.

A concentrated effort was expended to reduce the number of medical record deficiencies; the number of incomplete records reported in March 1971 was the lowest in the history of the Clinical Center.

The Chief, Medical Record Department, was appointed as a committee member and alternate chairman of the Interagency Committee on clinical record forms.

Three new Magnetic Tape/Selectric Typewriters were obtained to satisfy the requirements of a new program area, that is, the Computer Coding and Retrieval Project involving the final diagnoses and operations of Clinical Center patients.

Recalculation of all patient care statistics was completed for the period from 7-6-53 through 12-31-61. This project was undertaken in conjunction with the Computer Coding and Retrieval Project and to insure the uniform method of reporting of all required hospital statistics.

MAJOR PROBLEMS

It was difficult to stay abreast of the Fiscal Year 1971 workloads without a need for overtime in all sections.

The volume of non-dictated records was such that plans for investigation of new methods for dictating and dispatching them to the referring physician on more current basis were started; the help of the Medical Record Committee is being sought in this regard.

PROPOSED FUTURE OBJECTIVES

Future objectives are: (1) to complete the Computer Coding and Retireval Project for 1953 through present, and continue to coordinate with DCRT in the development of the program for the coding and retrieval project; (2)microfilm administrative hospital statistics; (3) acquire a decentralized dictating system utilizing IBM equipment; (4) continue to work with the National Center for Health Statistics for the revision of the 9th Edition of the International Classification of Diseases Adapted.

The Medical Record Department Chief began explcring ways to streamline admin-intrative and record procedures relating to the Special Ambulatory Care Program.

TABLE 1

STATISTICS FOR THE TRANSCRIBING SECTION

	July 1, 1970 March 31, 1971	April, May & June 1970	TOTAL
Discs received	7,464	2,501	9,965
Discs transcribed	7,531	2,539	10,070
Material transcribed (pages)	27,487 3/4	11,223 1/4	38,711

	1 FY 1970	2 FY 1971	3 Percentage + or -
Discs received	9,792	9,965	1.8%+
Discs transcribed	9,793	10,070	2.8%+
Material transcribed (pages)	42,242 3/4	38,711	8.4%-
Remaining work	95	16*	83.2%-

April, May and June, 1971 are projected statistics based on actual figures from April, May and June, 1970.

*Discs remaining as of 3-31-71

TABLE 2

PATIENT CARE STATISTICS

First Registration

Inpatients	1,192
Follow-up patients	2,251
Walk-in	10
Emergency	19

Patient Care Statistics

Total number of admissions	4,488
Total number of discharges (includes 198 deaths)	4,485
Total number of deaths	198
Percentage of deaths	4
Total number of autopsies	176
Percentage of autopsies	89
Available bed days	188,340
Total inpatient days	119,590
Average daily census	328
Percentage of bed occupancy	63
Discharged patient days	122,688
Average length of stay	27
Total number of patients admitted to the Clinical Center from 6 July 1953 through 30 June 1971	62,692

Special Ambulatory Care Program (SACP)

Admissions -872
Discharges -907

These are projected figures estimated for the final quarter.

July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

DEPARTMENT OF NUCLEAR MEDICINE

CC-66
Serial No.

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PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

DEPARTMENT OF NUCLEAR MEDICINE

CC-66
Serial No.

SUMMARY AND RECOMMENDATIONS

Fiscal year 1971 was a highly unusual period for the Department of Nuclear Medicine, a year of transition in which the Diagnostic Radioisotope and Whole Body Counter Sections functioned entirely without a full-time chief. Dr. Jack Davidson left the Department in the spring of 1970. Dr. Gerald Johnston, currently with the Nuclear Medicine Department of Letterman General Hospital, was named as the new chief in November 1970, but will not assume the position until July 1971. The Diagnostic Radioisotope and Whole Body Counter Sections were staffed by two clinical associates, Drs. Gerald Schall and Steven Larson, with Dr. Betty Hathaway, Chief of Diagnostic Radiology, as Acting Chief. Nevertheless, these sections were able to perform their service functions to the Clinical Center adequately and participated in several research projects with various institutes. The Radiation Safety Section will be discussed later in this report.

It is Dr. Johnston's desire to make the Department a fully integrated radionuclide unit providing service, research, and teaching functions regarding the use of radionuclides for all of the National Institutes of Health. The long-range goals for the Department include:

1) Performance, interpretation, and reporting of all diagnostic studies for the clinical services. Various function studies and in vitro work with radionuclides (particularly nuclear hematology) are scattered throughout the entire reservation. It would be far more efficient to do all such work in this Department.

2) Research projects: These divide into three categories.

A) "In-house" projects. These include basic research on nuclear instrumentation, development of new radionuclides, improvement of scanning techniques, etc. The projects can be done in the Department with minimal assistance from outside sources. This will require close cooperation between the Department and the Radiopharmacy. The possibility of obtaining our own cyclotron and radiopharmacy facilities is under active consideration. Facilities for housing animals and instrumentation designed exclusively for animal work will also be necessary.

B) Clinical research projects. These include any number of projects in which the Department cooperates with different institutes on the use of scanning procedures in the detection and management of specific diseases.

C) Consultation on basic research involving radionuclides. This may be on either beta or gamma emitters which are used for basic biochemical research as opposed to clinical research.

3) Teaching and consultation. These include all the clinical conferences at which patients having radionuclide procedures are presented. In this way there can be communication between the Department and the clinical services. New procedures may be introduced which the clinicians may not be aware of, and the Department can obtain feedback into what improvements in service may be required. In addition, an expanded and fully integrated Department of Nuclear Medicine might eventually be able to offer residency and fellowship training toward expected American Board of Nuclear Medicine.

Dr. Johnston has been fully supported in these goals by the administration, which has given full moral and financial encouragement to his plans for expanding the Department and has continuously shown great interest in our activities. Dr. Johnston has made plans for new equipment and personnel to smooth the transition when he does assume the office in July 1971.

The Department underwent a natural expansion during the year unrelated to the appointment of the new Director. A third technician, Mrs. Jean Honicker, joined the staff in November, increasing the technical staff by 50%. The new Ohio Nuclear dual-probe 5 inch rectilinear scanner was delivered in September. This instrument does whole-body scans and routine rectilinear work very rapidly. Because of this increased personnel and instrument capability, as well as the initiation of rotations for the technicians, we were able to offer expanded clinical services. As a general rule, a study was initiated no later than the second day after the requisition was received. Thus, thyroid scans and uptakes were done twice a week instead of once.

The actual studies performed based on the 1970 vs. 1969 calendar year actually declined 6%. However, these figures are somewhat misleading, as the complexity of the individual studies (number of views performed, dynamic studies, quantitation of studies, multiple tracer examinations) undoubtedly increased.

It is apparent that the size, structure, and function of this Department will drastically change in the next few years. The Diagnostic Radioisotope Scanning Section will come out of the shadow of Radiation Safety and earn its rightful role as a fully recognized service unit of the Clinical Center, alongside Diagnostic Radiology, Anatomic Pathology, Clinical Pathology, and the Blood Bank. Continued cooperation and an active dialogue between the administration, clinical services, and the Department will remain essential for success.

DIAGNOSTIC RADIOISOTOPE SECTION

Personnel - March 1971

Gerald L. Schall, M.D. - Clinical Associate
Steven M. Larson, M.D. - Clinical Associate
Felbert G. Lamb - Medical Radiological Technician
Kathleen Mae Henderson - Medical Radiological Technician
Jeanne Honicker - Medical Radiological Technician
Rebecca Miller - Secretary

Mrs. Honicker joined the Department in November, bringing the number of technicians to three. She had extensive experience with isotope scanning procedures at Suburban Hospital in Bethesda. There were no other significant changes in personnel.

A new method of performing the individual scans was successfully attempted. Three schedules were set up through which the technicians rotated for two-week periods. One rotation was all the central nervous system studies, another was bone and liver scans, and the third was the remainder of the imaging procedures as well as the function tests and special projects. In this way each technician knew exactly what work he was responsible for and delays in scheduling were minimized.

Beginning in July 1971, the Department will dramatically expand its staff. Dr. Gerald Johnston, of Letterman General Hospital, will be the new chief, and Dr. Eric Jones, of Walter Reed, will be the assistant chief. Two clinical associates will replace Dr. Schall who will be leaving. In addition, Dr. Johnston is planning to bring a full-time physicist and administrative assistant. It is hoped that the technician staff will be expanded commensurate with the expected increased scanning load.

Summary of Tests Performed

	Jan. 1969-Dec. 1969	Jan. 1970-Dec. 1970
brain scans (including rapid flows)	635	541
liver-spleen scans	334	516
bone scans	233	134
thyroid scans	237	162
lung scans	87	70
cisternograms	182	53
thyroid uptakes	291	402
renograms	168	98
miscellaneous	92	134
TOTAL	2,259	2,110

CLINICAL NUCLEAR MEDICINE EQUIPMENT

Present Equipment

Equipment	Date Acquired	Primary Use
Pho-Gamma III, gamma scintillation camera (Nuclear-Chicago)	1967	quantitative and dynamic studies - rapid static organ imaging
Pho-Dot rectilinear scanner (3 X 3 in.) (Nuclear-Chicago)	1966	Thyroid scans - liver-spleen uptakes
Dual probe whole body scanner (5 X 5 in.) (Ohio-Nuclear)	1970	whole body scans (bone, bone-marrow, I-retention) - routine organ scanning
Simultaneous four-probe rectilinear scanner ("tetrascanner" - NIH custom made)	1959	brain and cisternography scans
Thyroid uptake assembly (Nuclear-Chicago)	1967	thyroid uptakes
Mediac dose calibrator (Nuclear-Chicago)	1969	confirmation of doses

Equipment

The Ohio-Nuclear dual-probe 5 inch crystal whole-body scanner was finally delivered in September 1970, replacing an older model which was purchased in 1961. The new instrument is a very fast rectilinear scanning device which has the capability of doing a 5:1 reduction of the radionuclide distribution within the human body. This makes it especially valuable for bone scans, bone marrow scans, and screening exams for retention of ^{131}I in patients with metastatic thyroid carcinoma. The instrument adequately performs full size organ scans (liver, brain, etc.). A second scanner has been ordered primarily for use in our cooperative project with the NCI on the selective uptake of ^{67}Ga in hematologic and lung tumors.

A second gamma camera was also ordered. It will be a new HP (High Performance) model, comparable to our present camera. The photomultiplier tubes in the latter were replaced during the year, permitting increased resolution on the static studies. The new camera will be tied into the computer center by a special interface. Since most of our imaging devices are made by Nuclear-Chicago, we took out a service contract with the company for the first time this year covering all our equipment.

We attempted a new policy of "total flexibility" regarding which instrument could be used for a specific study. Early in the year the gamma camera was used for practically every study with the result that the rectilinear scanners were not efficiently employed. The technicians now have specific rotation responsibilities which encourages more even use of all the instruments. For example, a routine static brain scan is performed on the tetra-scanner as the "instrument-of-choice," but if it is not available, the gamma camera, Ohio-Nuclear, or Pho-dot can be easily utilized. Likewise, liver scans are now done about equally on the Ohio-Nuclear and the gamma camera. Only a few studies exist which are done exclusively on one instrument (dynamic studies on the camera, bone scans on the Ohio-Nuclear).

Equipment on Order

Equipment	Intended Use
Pho-Gamma III - High Performance scintillation camera (Nuclear-Chicago)	Improved resolution for better static studies. Improved efficiency for better quality dynamic studies. Computer compatible.
Renogram dual-probe system (Nuclear-Chicago)	Rapid renogram system for screening hypertensives without using the gamma camera.
Second dual-probe whole-body scanner (5 X 5 in.) (Ohio-Nuclear)	Primarily for use in the whole-body radio-gallium project of scanning patients with lymphomas.

WHOLE BODY COUNTER SECTION

Personnel

Raymond E. Murphy - Medical Instrumentation Specialist
Eleanor June Myers - Clinical Nurse
Katherine S. Davis - Clinical Nurse

This section continued to be the orphan of the Department, primarily because of the absence of a full-time physician-chief, the emphasis on clinical scanning procedures, and lack of understanding of this facility's function by the clinical service. June Myers and Katherine Davis continue to do an excellent job in running this Section. The counting procedures are done primarily in the realm of personnel monitoring, with a few metabolic studies. These are summarized below:

Clinical and health physics bioassays	FY 1970	FY 1971*
^{131}I (including whole body retention)	257	351
^{125}I	63	151
^{40}K	35	86
^{51}Cr	31	0
^{24}Na	2	0
^{47}Ca	2	0
^{32}P	0	13
	390	601
Body burden bioassays	186	216

* Extrapolated figures predicted on 8 months' results.

The increase in the number of studies performed represents the highly cyclical nature of many of the clinical projects. The 601 procedures were still down sharply from the 933 performed in FY 1969, or 1291 in FY 1968.

The T3 thyroid tests continued to be performed by this Section, an estimated 1650 exams. Experiments were performed on different resin adsorbing agents to see if an improvement could be found for the charcoal substance now used. Whole-body ^{131}I retention studies in patients with thyroid carcinoma continued to be of great use.

RADIATION SAFETY SECTION

General

The NIH Radiation Safety Operation continued to function as a section of the Department of Nuclear Medicine. Throughout the year there was an acting Chief of the Department and also an acting Chairman of the NIH Radiation Committee.

Although there was no increase in personnel, the demands on the Section for services increased in most areas. Notable were the larger number of NIH investigators utilizing the licenses, increases in specialized services rendered in connection with larger sources of ionizing radiation, and an increase in investigational overexposures and accidents involving licensed radioactive material. Increased utilization of outlying buildings such as 36, 37, 41, and the Auburn Building resulted in time losses due to larger distances to be covered. In addition, approximately 1/2 man year was lost due to illness of section employees.

Although there were no Atomic Energy Commission Compliance Division inspections of licenses during the year, there were two reportable overexposures to radiation on NIH employees.

A select site visit team, chosen by management, made a review of Radiation Safety activities at the National Institutes of Health and submitted a report on these safety activities.

Personnel

Mark O. Semler was appointed to the office of Deputy Radiation Safety Officer, NIH, during the second quarter of the fiscal year. The personnel complement remained the same. There were nine professional personnel on the staff and 12 supporting staff which included two part-time workers. Efforts were made to upgrade the skills of lower grade employees by formal training. For example, one GS-7 employee attended the 10-week Oak Ridge Health Physics Course, and a 40-hour Health Physics Monitor Training Course was presented to three staff technicians in the waste disposal group. This latter course met twice a week for four months.

Facilities

This was the first full year's use of the new addition to Building 21. The laboratory classroom facilities in the new addition were used 45 days for instructional purposes. When not used in this manner, a high level ^{3}H gas experiment utilized one of the two hoods, and the second hood was used by Radiation Safety personnel for calibrating radioactive gas monitors. All of the space in the addition was fully utilized throughout the year.

A new hood, programmed for the Gamma Assay Laboratory, was finally installed following a 2-year delay. Problems still persist in the temperature control and air flow for this new addition. However, the addition of an exhaust system to the building's mechanical room should do much to control excess heat that was being generated and trapped in this area and therefore affecting temperature control, particularly during the summer months.

The contract for the extension of the loading platform and installation of a second underground isotope retention tank was let. This should relieve the overcrowding in the waste disposal and packaging area and also double the short-lived liquid waste disposal holding capability.

The walk-in cold box, for use as a cold storage facility for radioactive animals, was installed in December of 1969. Five compressors have so far been installed. This cold box has been under repair for the past three months.

Problem Areas

There were two cases of overexposure requiring notification under Title 10, Code of Federal Regulations, Part 20:405. A 30 rem film badge β exposure resulted from carelessness when the film badge was placed for extended periods during the experiment next to hot sources. A thorough investigation, including duplication of badge exposure and patterns, resulted in assigning 400 mrem estimated skin exposure to this individual. An exposure in excess of 1.25 rem/quarter was also reported on an individual who carelessly carried a source of ^{131}I in his pocket next to the film badge monitor.

One ^{125}I, ^{131}I thyroid uptake following a contamination accident resulted in a nonreportable calculated thyroid exposure to a worker of $\sim$ 5 rads.

A reportable accident was narrowly avoided when a factory repairman working on the ^{60}Co teletherapy unit was alerted to the fact that the source had suddenly moved to the "on" position. Following the sounding of the separate alarm system in this area, he ran from the room and closed the shielded doors. Air pressures on the unit were allowed to bleed down overnight and the source was manually placed in the "off" position the next morning. It is reasonable to expect that a serious exposure would have occurred if the separate radiation alarm system, installed by Radiation Safety personnel, had not been previously placed in operation. It should be emphasized that this is the second time on this unit that a "highly improbably" accident has occurred. The Atomic Energy Commission and the manufacturer were alerted to this accident in an attempt to draw their attention to design changes that could prevent other occurrences of this type with similar irradiators.

Radioisotope Procurement

	FY '70	FY '71	Change
Millicuries*	81,024	84,335	+ 4%
Dollars	$682,300	$693,765	+ 2%
Shipments (Incoming)	6,076	6,061	< 1%
Shipments (Outgoing)	180	179	< 1%
Authorized Investigators	550	567	+ 3%
T.C.O. Orders Placed	3,825	3,920	+ 2%

* Not included are single large shipments such as plutonium cardiac pacemakers, the ≈ 30,000 curie cesium-137 irradiator facility, and the multicurie reloading of the NCI Co-60 irradiator since these are all separably licensed.

Radioactive Waste Disposal Shipments

	FY '70	FY '71	Change
55-gallon drums	235	244	+ 4%
Curies	30	39	+ 30%
Counting vials (shipments)	24	25	< 1%
30-gallon drums	964	1,105	+ 15%
Cost	$36,400	$34,875	*

* Reduction in cost/drum due to competitive bidding on contract.

Radioisotope Assays

	FY '70	FY '71	Change
Radiopharmaceutical Assays	3,470	3,204	- 8%*
Bioassays on Workers	610	487	- 20%**

* Reduction resulted primarily from lower numbers of clinical studies performed by the Diagnostic Radioisotope Section of the Department of Nuclear Medicine. However, standardization procedures were developed for two new nuclides, gallium-67 and rubidium-84.

** Reduction reflects lack of available health physicists to go out into active laboratory areas and request samples.

Laboratory Surveys

	FY '70	FY '71	Change
Surveys Performed	1,152	1,078	- 6%

In spite of the use of all possible overtime the number of surveys continued to drop. We continued to fall short of the minimal goal of a survey of every room utilizing quantities of radioactivity in excess of generally licensed limits at least once every six months. A recent computer listing of active areas showed better than 925 laboratories utilizing byproduct material.

Personnel Monitoring

The number of personnel film badges processed for FY '71 was 14,800. In addition, there was a tremendous increase in monitor badges utilized as area monitors around the new separably licensed sources. There were approximately 600 films processed for some 100 separate monitoring studies. Again, as was the case in past years, reminders were sent out to all licensed investigators to review their particular needs and eliminate all personnel from the service except those actively engaged in radioisotope work.

Along with the film badge monitoring, a supplemental thermoluminescent dosimetry system was incorporated into a number of film badges to provide both a back-up and research monitoring program for personnel monitoring. In addition to personnel monitoring, TLD's were used for environmental monitoring of the areas around the Linac and Co-60 radiation sources of the Radiation Branch, N.C.I. Extensive use of TLD's as environmental monitors is planned for the newly acquired cesium irradiator by the Radiation Branch.

At the request of the Diagnostic Radiology Department, CC, special studies involving TLD's in a phantom were conducted to evaluate radiation exposures for routine diagnostic radiographic procedures. These studies of patient exposure are expected to increase in frequency in light of recent concern for radiation hazards. One of these studies resulted in a significant decrease in exposure to critical organs while maintaining the necessary diagnostic quality of the radiographs by simply placing the patient in a prone rather than supine position.

Machines and Sealed Sources

Units Surveyed:	FY '70	FY '71
X-Ray Machines		
A. Diagnostic Units	35	61
B. Therapy and Research Units	10	8
C. X-Ray Diffraction Units	10	9
Electron Microscopes	57	23
Accelerators	3	4
	115	111

Efforts were made to bring to a close the Public Health Service Radium Loan Program for which Radiation Safety, NIH, had acted as custodian of the sources over the past 10 or more years. The Cancer Control Program of DCOP began to transfer permanently the custody of sources to qualified users. As a result, over 121 radium sources were shipped out in four shipments to locations throughout the United States during the year. Since the Department of Transportation Regulations changed considerably, it became difficult to locate proper shipping containers for these shipments. Rental shipping containers became unavailable and, as a final solution, modifications had to be made to a number of on-hand NIH shipping containers.

During the year 298 sealed sources requiring periodic leak testing under several licenses were surveyed. Twenty sources (2 curies) were considered surplus and disposed of as radioactive waste.

Computer Programming Group

Extensive work by the Computer Programming group resulted in a more complete and timely record-keeping system for the Radiation Safety Section. The following is a summary of the more significant changes and additions made during the fiscal year, 1971.

A. Isotope Receipts and Annual Isotope Inventory

1. The entire process for keeping records for the isotope receipts and for generating the monthly and annual isotope receipt reports was computerized. This change resulted in a more accurate and more efficient process and substantially reduced the time required to produce these reports.

2. The "log-in" format was changed to allow the time-consuming job of coding this data onto IBM cards to be done by the Keypunch Unit of the Computer Center instead of by the RSS clerical staff.

3. The new report system generates its own address labels for the 200 forms sent on a monthly basis to investigators who have purchased isotopes during that period.

4. The data storage was changed from IBM cards to computer tape, thus eliminating the filing and storage of over 6000 cards annually.

B. Assay Program

1. The assay program was completely rewritten in the COBOL language. This change from FORTRAN IV to COBOL reduced the cost of running the program from $100/week to less than $6/week.

2. The new program generates a more legible format for computer tape data storage.

C. Film Badge Program

1. A program for generating both quarterly and annual personnel exposure reports (required by the AEC) was modified so that it could be run by personnel untrained in computer programming.

2. A program for generating a memorandum to people who have received no detectable exposure for more than 12 months was modified so that it could be run by non-computer personnel. This memorandum significantly decreased the number of people who did not require film badges but were still being processed on a monthly basis.

D. Approved Investigators and Laboratory Data

1. A faster, less expensive, and more complete computer system was developed for processing data concerning investigators approved for isotope purchase and data for laboratories in which isotopes are used. This data will serve as a major interface to the Master Information System currently under development.

2. A complete update of approved investigators and isotope laboratory data was made from the information received from the 1970 isotope inventory.

A Master Information System (MIS) is currently in the developmental stage. This set of related programs will cross-reference the records of the various Radiation Safety groups, thus reducing duplicated efforts in this area. Further, MIS will allow rapid access of all records by any of the Radiation Safety staff, will include numerous internal checks for possible radiation hazards and record-keeping discrepancies, will relieve health physicists of many of the daily routine decisions which are made on the basis of information available to the computer files, and will allow immediate retrieval of data pertinent to a particular radiation emergency.

Training Courses

Three courses, "Radiological Health for Radionuclide Users," were presented by the Rockville training section of the Bureau of Radiological Health. The NIH Radiation Safety Section staff presented about one-fifth of the lectures, and in addition, conducted four of the five laboratory sessions for each course. These courses were given the following dates: September 28 - October 9, 1970, January 11 - 22, 1971, and April 26 - May 7, 1971. The October and April courses were given in the laboratory classroom facilities of Building 21 and the January course was presented at Rockville, Maryland. One-hundred-forty NIH investigators were trained.

As mentioned previously, a 40-hour Health Physics Technician Training Course was presented to three technicians in the RSS waste disposal group. This course met twice a week for four months.

The training staff of the Bureau of Radiological Health requested permission, which was granted, to utilize the Building 21 laboratory classroom in February 1971 for a one week radiopharmaceutical course.

Approximately 110 nurses were instructed in radiation safety procedures as part of their nurses training or indoctrination program during the year. One course was given during each month for the 12-month period.

HIGHLIGHTS

Scientific papers were presented at meetings by staff members as listed below.

"Salivary Scintigraphy in the Evaluation of Patients with Sjögren's syndrom." Presented by Gerald L. Schall, M.D., at the 17th Annual Meeting of the Society of Nuclear Medicine, Washington, D.C., July 6-12, 1970.

"Comparative Cerebral Scintigraphy with ^{99m}Tc-pertechnetate and ^{99m}Tc-albumin." Presented by Gerald L. Schall, M.D., at the 17th Annual Meeting of the Society of Nuclear Medicine, Washington, D.C., July 6-12, 1970.

"Detection of Thyroid Carcinoma Metastases Using Whole-Body Retention of ^{131}I and Gamma Camera Scintigraphy." Presented by Louis S. Zeiger, M.D., at the 17th Annual Meeting of the Society of Nuclear Medicine, Washington, D.C., July 6-12, 1970.

"The Unsuccessful Injection in Cisternography: Incidence, Cause and Appearance." Presented by Steven M. Larson, M.D., at the Symposium on Cisternography and Hydrocephalus, Washington, D.C., May 6-7, 1971.

"The Incidence, Cause, and Appearance of the Unsuccessful Injection in Cisternography." Presented by Steven M. Larson, M.D., at the 18th Annual Meeting of the Society of Nuclear Medicine, Los Angeles, California. June 27-July 2, 1971.

"Radiation Dosimetry in Full Chest Tomography," Presented by William M. Wagner at the Sixth Joint Meeting of the Clinical Society and the Commissioned Officers of the U.S.P.H.S Association, Galveston, Texas, April 4-7, 1971.

"Standardization and Calibration of Radionuclides," invited teaching session. Presented by Patricia C. Vacca at the 18th Annual Meeting of the Society of Nuclear Medicine, Los Angeles, California, June 27-July 2, 1971.

Scientific exhibits were presented at the following meetings:

"A Photographic Technique for Color Processing Dual-Radioisotopic Scintigraphy," by Louis S. Zeiger, M.D., Gerald L. Schall, M.D., and Giovanni Di Chiro, M.D., was presented at the 17th Annual Meeting of the Society of Nuclear Medicine, Washington, D.C., July 6-12, 1970.

An expanded version of the above exhibit was also presented at the 56th Scientific Assembly and Annual Meeting of the Radiologic Society of North America, Chicago, Illinois, Nov. 29-Dec. 4, 1970.

RESEARCH PROJECTS IN PROGRESS

1. Quantitation of Pertechnetate Uptake by the Parotid Glands in Patients with Sjogren's Syndrome. This is a continuation of a project in which we showed that the qualitative estimation of the ability of the salivary glands to concentrate and excrete ^{99m}Tc-pertechnetate was closely related to the patient's clinical status, results of the salivary flow rate determination, and contrast sialography, but was not related to the results of minor salivary gland biopsy or antisalivary duct antibody determination. This project attempts to quantitate the amount of pertechnetate uptake by the parotid gland using a gamma scintillation camera video-tape system and "region-of-interest" playback system. The studies are also repeated using ^{99m}Tc-labeled albumin to correct for vascular background.

Investigators: G. Schall, Nuclear Medicine
L. Anderson, NIDR, DMS
S. Larson, Nuclear Medicine
J. Griffith, Biomedical Engineering

2. Factors Causing a "Bad" Injection in Radioisotope Cisternography. Faulty injections in cisternography are a common and difficult problem. A retrospective study has shown that previous lumbar punctures and pneumoencephalography, per se, do not influence the incidence of inadequate injections. Rather, factors at the time of the injection itself seem to play a role. All injections are now performed with the patient positioned on the gamma camera, and the study is performed on video tape for later analysis. Epidural injections, subdural injections, and injections in muscle or a spinal ligament appear to contribute to the incidence of bad injections.

Investigators: S. Larson, NM
G. Schall, NM
G. Di Chiro, NINDS

3. Detection of Functioning Thyroid Carcinoma Metastases by Whole-Body ^{131}I Scanning and Metabolic Retention Studies. Patients are given 1 mCi of ^{131}I following surgical or radiation ablation of the thyroid gland. The retention of the radioiodine, expressed as a percentage of the administered dose, is calculated by counting the patient in a "high-activity" total body counting room. A whole body scan visually demonstrates the distribution of the tracer within the body and in any functioning metastases.

Investigators: L. Zeiger, (formerly NM)
J. Robbins, NIAMD
G. Schall, NM

4. Development of Myocardial Scanning Agents - ^{84}Rb and ^{131}I-Fatty Acids. This project with the Cardiology Branch of the NHLI continued. ^{84}RbCl was injected intravenously in humans for the first time with equivocal visualization of the myocardium. Intra-arterial coronary injections may prove more fruitful. Studies were initiated in cats using radioiodinated fatty

acids with encouraging initial results. An attempt will be made to secure ^{42}K, another intracellular myocardial scanning agent, for use at NIH.

Investigators: R. Goldstein, NHLI
D. Rosing, NHLI
G. Schall, NM
S. Larson, NM

5. Accuracy of Brain Scan in 50 Histologically Proven Oligodendrogliomas. Oliogodendrogliomas are a very rare brain tumor, accounting for only 3% of all such tumors. Even in large series of brain scans there are only a few "oligos," so that no statistically significant statement can be made about their detectability on the brain scan. By computer retrieval, 50 of these tumors have been collected which will be studied with respect to which histologic features influence detection on the scan.

Investigators: G. Schall, NM
R. Hefner, AFIP
H. Handmaker, USAMD

6. Correlation of Liver Size Determined by Percussion Vs. Scan. Percussion is a time-honored and convenient bedside method of determining liver size. However, the results are subject to several sources of error such as anatomic idiosyncrasies, obesity, and strength of the percussion. The uptake of radiocolloid by the liver permits an accurate method of documenting the actual liver size. The dimensions of the liver at several different planes determined by percussion are marked on the scan and compared with the actual measurements.

Investigators: T. Chalmers, Director, CC
S. Larson, NM
G. Schall, NM

7. Spleen Uptakes of Radiocolloid in Lupus Erythematosus. Measuring the rate of splenic uptake of ^{99m}Tc-sulfur colloid is a useful test of spleen activity. Hypersplenism with resultant anemia has been noted in several rheumatoid-type diseases, including lupus erythematosus. The colloid is injected intravenously and the time needed to read the maximum level of spleen activity is recorded. Both LE patients and controls are used. The influence of Cytoxan on the course of the disease and on spleen function can also be measured.

Investigators: J. Decker, NIAMD
S. Larson, NM
G. Schall, NM

8. Tumor Scanning with Gallium in Patients with Hodgkin's Disease and Carcinoma of the Lung. ^{67}Ga has been shown to concentrate in certain malignancies, including a wide range of malignant lymphomas. There are significant implications for staging patients with malignant tumors and for following response to therapy. Using the whole body scanner, a convenient display of the distribution of ^{67}Ga in the entire body can be

made and occult tumors detected. In cooperation with ORNL and NCI we are beginning a project of scanning patients with Hodgkin's disease and carcinoma of the lung to ascertain the usefulness of radiogallium scanning.

Investigators: P. Carbone, NCI
S. Larson, NM
G. Schall, NM

9. Isotope Measurement of Cerebral Blood Flow by External Counting. The transit time of an intravenously administered radionuclide (^{99m}Tc-O) can be determined using a gamma camera-video tape-"region-of-interest" system. Cursors are placed over the internal carotid and middle cerebral arteries, and corrections for the stringing out effect of the bolus made with a computer. Measurements are made in both normals and patients with cerebrovascular disease.

Investigators: S. Larson, NM
J. Bailey, Computer Research
G. Schall, NM
J. Griffith, Biomedical Engineering

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PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

NURSING DEPARTMENT

CC-28
Serial No.

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July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

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PROGRAM GOALS

The long-range goals of the Nursing Department continued to be:

1. To provide the best nursing care possible with the available nursing personnel.

2. To develop all personnel in the Nursing Department to the fullest extent of their capabilities and the professional nurse as a fully professional individual.

3. To share with the community those accomplishments in the Nursing Department which are appropriate for the full development of nursing as a community service.

In order to accomplish these long-range objectives the Nursing Administrative Council set short-range goals which members believed could be accomplished within a year's time. The short-range goals for FY 1971 were:

1. The continuation of experimental trials to determine the most effective use of personnel in meeting both the patient care and research requirements of the individual nursing units.

2. The revision of the inservice education program to put emphasis on planned discussions by senior investigators.

3. The establishment of a pre-planned program of workshops to provide for pooling of ideas in meeting some of the major problems of the Nursing Department.

4. The continuation of the rotating-type experience for the graduate of the Associate Arts program.

5. The incorporation of classes for practical nurses to progress from GS 4 to GS 5 in the routine class schedule.

6. The development of male teams for a uniform approach to the care of male patients and to utilize the capabilities of military corpsmen to the geatest degree possible.

7. The systematic review and evaluation of the clinical nurse expert as she functions in the individual nursing services.

8. The continuation of the utilization of personnel other than those in the Nursing Department for supportive care of patients.

9. The development of a play therapy program for selected nursing units of the Clinical Center to supplement the present program offered by the Patient Activity Section.

10. The development of a plan to expedite delivery of laboratory specimens from the nursing units to the laboratories.

11. The continuation of rotation of tours for all nursing personnel as a requirement for employment at the Clinical Center.

12. The transfer of the responsibility for conferences with new employees to members of the Staff Nurse Advisory Committee.

13. The incorporation of systematic review sessions for management in a cardiac arrest situation into the annual inservice education schedule.

14. The reviving of our efforts to better the understanding between nursing service administrators and nurse educators through visits to schools and exchange programs with schools of nursing.

PROGRESS MADE

The shortage of personnel and increasing program demands made FY 1971 the most difficult year yet experienced by the Nursing Department. Despite the rising impedimenta to good nursing care the nursing personnel were untiring in their efforts to give quality nursing care to patients and there were some accomplishments which were noteworthy.

The establishment of a well-trained male nursing assistant team on the Cancer Nursing Service proved to be of immeasurable assistance in providing quality nursing care for the acutely ill male patient. The team leader is a dedicated, intelligent former corspman who directs three team members in providing essential daily care for the most acutely ill male patients on the Cancer Nursing Service. With the current shortage of professional and practical nurses it became mandatory for us to maintain an on-going training program for nursing assistants. The employee with military corpsman preparation proved to be a great asset on the nursing unit.

The combined efforts of the senior and junior administrative staffs resulted in continuation of the on-going assessment of nursing practices and routines with revision of procedure where indicated and change in routine when time could be saved. There were numerous changes in forms with considerable reduction in time spent on charting. The administrative unit clerks were very helpful in reducing time spent by nurses in routine checking of charts, supplies, and equipment, but we had difficulty retaining these clerks after training, as

they can go on to higher grades within other institutes or other agencies. The expanded utilization of practical nurses proved to be a means of partially meeting the demands for continuous care and we found it possible to leave a capable practical nurse in charge of the evening or night tours of duty on selected units where the degree of illness did not require the professional judgment of the registered nurse.

Morale in the Nursing Department was understandably low during the past two years and the Inservice Education Committee made a great effort to make the work situation interesting and stimulating for all categories of personnel. In this direction great emphasis was placed on discussions of current research projects by senior investigators. One of the frequent complaints from employees is their lack of knowledge about the results from studies involving their day to day efforts.

The Inservice Education program also included planned workshops for head nurses, staff nurses, and practical nurses. The workshops provide an arena for the pooling of ideas and working through the evaluation and implementation of those ideas which are workable and have obvious merit. One of the most productive was the workshop designed to explore all of the facilities within the Clinical Center which could be utilized to expedite and improve patient care and which were not usually utilized in daily routines. The planning involved many departments and many areas about which little was known. The participants and the nurses found avenues by which there could be reciprocal assistance, and the workshop was considered to be one of the most productive and beneficial of the year's activities.

A thorough review of the responsibilities and expectations of the clinical nurse expert was undertaken in September 1970 and is continuing. Through discussion and on-the-job evaluation the position was thoroughly reviewed, and in some instances a decision was made to eliminate the job and convert the positions to a more productive activity.

During the year we worked with the chaplains and the patient activity personnel in trying to determine a means of reducing demands on nursing personnel by having daily visits to difficult patients by selected personnel - from the chaplains, patient activity, and nursing personnel. This type of friendly visiting did much to provide a greater sense of security for some of the more difficult patients and has placed emphasis on the fact that staff nurses have a resource beyond the patient unit.

During the summer of 1970 a play program for the children in the study on mental retardation was undertaken by a university student employed for the summer. This program had considerable merit for the children and relieved the nursing staff for care of the more ill patients. Unfortunately, the program terminated when the university student returned to her academic pursuits. We have not been able to recruit a full time play therapist but our efforts continue in this direction.

The attempt to bridge the gap between nursing service and nursing education was fostered in a number of ways. We again invited schools of nursing, which

had requested assistance, to demonstration days, one in the fall and one in the spring, when each nursing service demonstrated typical aspects of patient care with full explanation of the nursing aspects, research implications, and educational emphasis for staff development.

We continued to publish the nursing care conferences which each nursing service presents annually. These monographs are in great demand and are a source of satisfaction for the participants who spend many hours of their own time in preparing the content. This, too, is part of our inservice program toward developing the nurse as a professional individual.

The Chief and Deputy Chief, Nursing Department, arranged several conferences with Deans of Schools of Nursing as a preliminary to the development of an educational experience program for baccalaureate students in nursing.

An arrangement was made with the American Cancer Society to provide a work-learning experience for students in schools of nursing who have completed the third year of a four year program. One of the objectives of the American Cancer Society is to recruit nurses for cooperating agencies in order to emphasize the importance of quality patient care directly administered to the patient with malignancies.

The Education and Training Section conducted training programs for 222 personnel resulting in their increased responsibility in the nursing care of patients and advancement in grade. A manual for the training of nursing unit clerks was completed during the year.

The separation of the Eye Nursing Service from the Neurology Nursing Service was accomplished during the year. In preparation for an increase in program by the National Eye Institute two nurses received three months experiential training at the Wilmer Ophthamological Institute of the Johns Hopkins Medical Center. The organization of the Eye Nursing Service has been completed with a system of interchange of personnel between the ophthamological unit and the Eye Clinic.

We were interested in the use of the computer to expedite the nursing unit activities and we watched and evaluated the punched card system for laboratory requests and the Kardex printout now being used on 9 East. One nurse is involved in the latter trial period, which, to date, has been highly satisfactory.

It is indeed an accomplishment that the Nursing Department, Clinical Center, was able to maintain an adequate nursing program during FY 1971 when the number of personnel available for nursing care and restricted by budgetary ceiling was far below the number needed for 1) quality nursing care, and for 2) adequate support of medical research.

DEVELOPMENT AND TRENDS

As reported in the annual report for FY 1970, the pattern of patient care in the Clinical Center continues to change. The use of very potent drugs, singly and in combination, in the leukemia project placed increasing responsibility on professional nurses because the observation of these patients, who can have

rapid, untoward reactions, is very demanding. The increase in the number of protocols in almost every service placed widening responsibility on nursing personnel and the utilization of the Outpatient Department for prolonged daily therapy placed an almost insupportable burden on the limited nursing staff. On the Psychiatric Nursing Service the number of acutely psychotic patients increased with resulting hazards to both patients and personnel. The need for male assistance on the Psychiatric Nursing Service was continuously acute. The Heart surgical program placed the greatest single demand on nursing service during the past year. The average number of six surgical cases scheduled per week was more than the post-operative nursing unit was able to accommodate, especially since the complications following surgery placed a demand for continuous care that was beyond the abilities of the assigned staff to meet and space problems were acute most of the time. It appears that this service will continue to expand and standards of nursing care will decrease.

There is every evidence that the National Heart and Lung Institute plans a very extended program for FY 1972 and discussions with various groups lead to apprehension for adequate nursing support. There are other institutes which are also planning on expanding programs, all with merit, but the shortage of available practical nurses and professional nurses is a clear indication of the need for a greatly extended training program for nursing assistants. The current available space for these training programs is totally inadequate so one can only foresee mounting problems in maintaining an adequate nursing staff for the anticipated increase in demand.

Our experience over the past year has led to some interesting and somewhat alarming conclusions. The average time required to orient the professional nurse to nursing activities in the Clinical Center was two months. Our observations lead us to believe that the evident changes in preparation for nursing in all programs of nursing education were not adequate for the young nurse graduate to assume the responsibility for patient care, either in the performance of nursing techniques or in the judgment area, for patient safety. Thus, we were placed in the position of having to provide an intensive orientation program incorporating a considerable amount of training in order for the young graduate nurse to perform at a minimal level of responsibility. In some instances four months were required to provide the necessary teaching for patient safety, and we are rapidly coming to the conclusion that our present rotation of assignment under supervision, now required for the 2-year graduate, should be a requirement for all recently graduated nurses employed in the Nursing Department.

The quality of nursing care for patients at the Clinical Center decreased, but was surprisingly good when one considers the number of persons available to provide nursing care. We received numerous complimentary letters from grateful patients and families and great admiration is due the staff group who provided this care at great physical and emotional stress. Morale was consistently low and there was a higher rate of turnover during the past year than was true in previous years.

It is also noteworthy that errors in nursing care increased. In previous years we were singularly fortunate in having very few errors in medication or in the collection of specimens. This past year there were disturbing errors in both

areas, which wrongly or rightly appeared to be directly related to the shortage of conscientious personnel. The need for haste to accomplish the 24-hour routines seemed to be a major factor in error.

The average length of stay for patients seems to be decreasing and there seems to be a trend in the direction of increasing the SACP program. Such a trend produces more acutely ill patients on the nursing units and an increasing load in the Outpatient area. The need for employed women in the play area becomes increasingly evident. The lack of stability in program, personnel, and demand is an integral part of clinical research, but this aspect of clinical research makes for great difficulty in planning for proper nursing support. The changing nature of the child population was of great concern and we will make every effort to secure responsbile persons for maintaining a safe and productive play program in the year ahead. This type of program can take a great deal of strain off the staff responsible for nursing care.

The expanded use of the computer for nursing routines can only lead us to believe that the use of the computer to our advantage is an ever-increasing possibility and our plans for the coming year include considerable computer time.

There were indications of increasing militancy and unrest among all groups of employees and the Nursing Department employees were no exception. It was no longer possible to require the overtime we had requested in the past, and the amount of evening and night duty needed for safe patient care was a source of controversy. The physical and emotional demands on nursing personnel continued to be great with evident dissatisfaction with this aspect of employment. Administrative efforts were directed toward innovative means of raising morale and a constant recognition of staff needs and accomplishments.

RESEARCH STUDY PROJECTS

The Nursing Research Study Project, "To Determine the Comparative Capabilities of the Basic Diploma Graduate and the College Prepared Graduate in a Twelve Month Period When the Background Experience is Known" continued. It will be completed in September 1971. Thus far, 582 professional nurses have participated in this study since September 1965.

In August 1969 a short term study was begun and data collecting ended in September 1970. This study was designed to determine whether there was a difference in the effectiveness of the newly employed professional nurse after one year's experience in nursing at the Clinical Center between the nurses completing the first structured orientation program (A) and the new orientation program of supervised practice (B). Thirty-five professional nurses were observed initially, and of this group 13 nurses completed the study for all areas of data collecting. The statistical findings prepared by Mr. David Selby showed the oriented nurses performed three out of five nursing procedures significantly better than the control group. The mean score on the test of nursing knowledge was higher for the study group than for the control group but not a statistically significant difference, indicating the value of continuing this longer experiential orientation with supervised practice.

On March 16, 1970, an additional project was started and is continuing. This

study was initiated to determine whether or not additional facilities in the Clinical Center could be used to lessen the nursing care demands on a patient unit. The research hypothesis is that patients who are given friendly attention by members of the Clinical Center staff, other than those regularly scheduled on the nursing unit, will be less demanding of nursing time when the need is for emotional support rather than a physical need. To date, 28 patients were referred to this study group and 24 patients were visited. Fifteen patients completed the four weeks of the study. Several patients died while on the study, and several were discharged home or to another facility. Three patients are presently continuing on the study. Two patients were readmitted and are visited occasionally; several other patients will be readmitted in the near future and these too will be visited again.

Most often these patients were depressed and created a nursing problem because they would not communicate and thus allow the nurse assigned to the unit to assist them adequately. The average visit duration was 30 minutes, and one person of the research group tried to visit daily. Favorable response was received from the staff as well as the patients from these visits of friendship.

A fourth project was inaugurated in October by the initiation of a Nursing Unit Activities Study. A pilot study was conducted to test our data collecting tools; and from over 2000 observations we learned that 57% of staff time is spent in patient care activities, direct and indirect nursing care.

The Activities Study was completed December 12, 1970, and the data tabulated and submitted to DCRT for computer analysis. Funds were approved for this particular project and consultation was provided by Dr. Anthony J. Rourke.

Preliminary analysis of the data indicated that all nursing personnel on the nursing unit 13 East worked more than 50% of their time in their correct job category with the exception of the Nursing Assistant group. This group was able to work down through their grade level. That is, GS 4 Nursing Assistant when not engaged in tasks at his level spent a large portion of time in GS 3 or GS 2 Nursing Assistant level work. This can be explained by the fact that there was only one GS 2 Nursing Assistant assigned to this nursing unit during the latter part of the study time. Further explanation of the data will be forthcoming.

MAJOR PROBLEMS

1. The shortage of personnel continued to be the major problem in the Nursing Department. Although restrictions on hiring eased to a certain extent, we continued to suffer from our inability to employ persons available. Our present shortage is acute in the practical nurse category.

2. The turnover of staff during the past year increased, increasing the cost of nursing service considerably due to loss of trained personnel and increasing the inefficiency resulting from responsibilities placed on inadequately trained new employees.

3. Staff morale was very low and resulted from many factors. There was too much evening and night duty due to the shortage of staff. Overtime was

excessive because of the necessity for 24-hour service in a hospital environment. Staff development suffered due to shortage of staff when all time had to be utilized in the nursing unit.

4. The shortage of clerical staff and practical nurses was particularly acute despite an accelerated recruitment program. The administrative unit clerk can be very productive in the nursing unit activities, but the interest in grade increase causes a too frequent turnover of persons in this category with resulting inefficiency. The recruitment of male nursing assistants improved somewhat although there continued to be need in this area.

5. The decrease in the number of social workers, housekeeping personnel, and occupational therapists placed an added burden on nursing unit personnel. The nature of the research programs was such that patients frequently stayed for long periods of time; under these circumstances the need for supportive care increased and there was an inadequate number of personnel available to meet these needs. In addition, there was a real need for a cleaner environment for patients.

6. The lack of space continued to be an acute problem. In order for nursing care to be administered to patients, there must be adequate utility, supply, examining, and storage space on the nursing unit. The available space for functioning continued to decrease to a point where patient care was noticeably impeded. The space for training activities decreased to such an extent that the inadequacies will materially affect the training programs. In order for clinical research to be effective the support services must function at a high level of efficiency. Efficiency is obtained by careful training of personnel to function intelligently with economical use of time and supplies. With the present space allotted for training we will not be able to run parallel training programs and an orientation program, too. Undoubtedly, this will result in loss of personnel as upward mobility has always been a part of planning in the Nursing Department and we promote people as quickly as we can train them for increased responsibility. Delay in training for grade increase will have an effect both on retention and recruitment. There is also a real need for play space for children who wander into restricted areas because there is no place where they can be occupied and no one to supervise them.

7. The indications for continuous nursing care did not abate and we were not able to provide all of the special nursing care that was obviously needed. The unexpected postoperative complications on the Heart Surgical unit necessitated much longer periods of intensive care than was the case in previous years. Four patients on 6 West were on continuous nursing care for more than six weeks during the early part of 1971, and throughout the year there was an increased number of patients with acute congestive failure, renal shutdown, and respiratory complications. These patients required very intensive nursing care not available with our present complement of staff. The physicians of the National Institute of Neurological Diseases and Stroke were most unhappy over the lack of adequate nursing personnel for continuous care.

8. There is a real need to secure an adequate intercommunication system on

each nursing unit. The present system is old and no longer satisfactory. This is an expensive project but replacement is long overdue.

9. The increase in laboratory specimens and the difficulties surrounding them make it mandatory to mention again the need for a central receiving and sorting room. In association with the specimen problem there was also the problem of inadequate messenger and escort service mentioned in the report for FY 1970. The number of appointments scheduled for patients and the number of laboratory specimens to be delivered calls for more personnel in this category than the present personnel ceiling allows.

10. The responsibility for blood drawing, delegated to the Nursing Department in March 1971, was accompanied by problems, resistance to change, and a decreased time for direct care of patients.

11. Both parking and housing continued to be problems related to the maintenance of a satisfactory nursing service.

12. The present payroll system put an unconscionable burden on the departments of the Clinical Center and seriously detracted from nursing care of patients because of the time involved in record keeping.

ACCOMPLISHMENTS

1. Despite the acute shortage of personnel and an accelerated nursing program we were able to keep our emphasis on quality care of patients. The leadership abilities of the head nurses were very evident during FY 1971 in that they were able to direct the staff in the selection of priorities so that essential activities were accomplished although many of the niceties of nursing care were not possible.

2. A revision of the Kardex assisted in providing improved nursing care plans with less work for maintaining a current work record and a revision in the Medication-Treatment sheet eliminated much routine paper work for the professional nurse.

3. Nursing personnel were trained in vena puncture technique in a relatively short time, and at the time of writing, the majority of routine blood specimens are being secured by nursing personnel.

4. The coordination of inservice nursing programs resulted in fewer demands on individual nursing units and a broader program for all categories of personnel. An administrative decision was reached early in FY 1971 that a meaningful inservice educational program should continue in the interest of improved staff morale.

5. An experimental program on computer use for nursing unit routines was initiated on 9 East in the latter part of 1970. This program to date has proven to be time saving and efficient for nursing unit use.

6. An experimental trial period for the use of exchange supply carts was established for nursing unit 10 East with good results.

7. The Outpatient Nursing Service completed plans for a 5-bed area to facilitate the care of pre- and post-operative lymphangiogram patients.

8. The evaluation of the role of the clinical research nurse was begun with some change in thinking regarding responsibilities when there is a marked reduction in staff.

9. The orientation program for registered nurses was revised with the establishment of 12 East and 12 West as the assignment units for the orientation period.

10. Since November 1, 1970 part of nursing services in the Outpatient Department have been supplied by nursing unit personnel being assigned to concurrent responsibilities in the Outpatient area. It is hoped that in this way nurses can become more aware of the continuity of nursing care and the results of hospitalization. This is particularly important for nurses assigned to the Cancer Nursing Service.

11. The number of male nursing assistants increased and recruitment efforts continued in this direction. The Cancer Nursing Care Team made up of former military corpsmen proved to be a very great asset. Ten additional male employees were trained to function in this way in other services.

12. Practical nurses were used at a higher level of responsibility on all services.

13. The Neurology Nursing Service produced 49 videotapes and 42 audiotapes to assist nursing personnel to become familiar with and better understand the nursing care of patients on 5 East and 5 West. This is a more efficient means of keeping nursing requirements current than is the one to one interpretation. In addition, the Neurology Nursing Service produced a nursing manual on neurological nursing procedures and nursing care of neurological conditions which helped considerably in maintaining safe nursing care for the neurologically handicapped patient.

14. A number of head nurses and potential head nurses attended the Introduction to Supervision course arranged by the Personnel Office.

15. Nurses on the Cancer Nursing Service requested some emotional support from an available psychiatrist. Dr. Harold Greenberg volunteered to assist in group discussions with interested nursing personnel. The Nursing Department was extremely grateful for this assistance.

16. Two nurses were sent for three months training to the Wilmer Ophthamalogical Institute of the Johns Hopkins Medical Center for preparation in ophthamalogical nursing. One nurse was prepared for assignment in the Eye Surgical Suite and one as a clinical nurse expert on the newly created Eye Nursing Service.

17. The Staff Nurse Advisory Committee was given increased responsibility for organizational matters related to the professional staff nurse group. The staff development program was reorganized to provide for gradually in-

creasing responsibility of staff nurses for their own development.

18. The number of schools requesting speakers on nursing activities from the Clinical Center increased with a resulting increase in the number of staff nurses assigned to meet these requests. This provision of speakers for schools of nursing is an effective recruitment device for the Nursing Department.

19. Student Demonstration Days were scheduled on November 4, 1970 and April 14, 1971. On Student Day, schools of nursing were invited to send students to see and hear the nursing aspects of clinical research, which proved to be very popular. Over 200 students accompanied by instructors attended each of these sessions.

PUBLICATIONS

Dunn, M. A.: Development of an instrument to measure nursing performance. Nurs. Res. 19: 502-510, 1970.

Ellis, G.: Inservice education in a clinical research hospital. J. Cont. Ed. Nurs. 2 (No. 3): 7-13, 1971.

Peterson, M., Painter, Y., Wright, B.: Nursing care of patients with cerebral seizures. A nursing clinical conference. U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health. Washington, D. C., U. S. Government Printing Office, 1971, 16 pp.

Table 1
Hours of Continuous Nursing Care
Provided by Each Nursing Service
May 1, 1970 - April 30, 1971

Nursing Service	May 1, 1970 to April 30, 1971
	Hours
Allergy and Infectious Diseases Nursing Service	2,783.50
Arthritis and Metabolic Diseases Nursing Service	6,756.00
Cancer Nursing Service	12,718.50
Heart Nursing Service	31,672.25
Neurology Nursing Service	6,588.75
Psychiatric Nursing Service	6,723.75
Total	67,242.75
Number of man days	8,405.34
Number of man years	32.20

Table 2
Hours of Continuous Nursing Care
Provided by Each Nursing Service
Fiscal years 1970 and 1971
(For Comparison)

Nursing Service	1970	1971
	Hours	Hours
Allergy and Infectious Diseases Nursing Service	4,516.50	2,783.50
Arthritis and Metabolic Diseases Nursing Service	5,716.00	6,756.00
Cancer Nursing Service	9,585.50	12,718.50
Heart Nursing Service	22,395.50	31,672.25
Neurology Nursing Service	1,989.25	6,588.75
Psychiatric Nursing Service	5,053.25	6,723.75
Total	49,256.00	67,242.75
Number of man days	6,157.00	8,405.34
Number of man years	23.59	32.20

Table 3
Number of Hours of Nursing Care Given
By Part-Time Professional Nurses (WAE)
On Each Nursing Service
May 1, 1970 - April 30, 1971

Nursing Service	May 1, 1970 to April 30, 1971
	Hours
Outpatient Nursing Service	1,175.50
Allergy and Infectious Diseases Nursing Service	4,592.25
Arthritis and Metabolic Diseases Nursing Service	6,967.25
Cancer Nursing Service	24,543.00
Eye Nursing Service*	1,633.00
Heart Nursing Service	17,299.50
Neurology Nursing Service	12,645.50
Psychiatric Nursing Service	4,310.25
Education and Training (Orientation)	930.50
Total	74,096.75
Number of man days	9,262.09
Number of man years	35.48

* September 1, 1970 to April 30, 1971

Table 4
Number of Hours of Nursing Care Given
By Part-Time Professional Nurses (WAE)
On Each Nursing Service

Fiscal Years 1970 and 1971
(For Comparison)

Nursing Service	1970	1971
	Hours	Hours
Outpatient Nursing Service	256.00	1,175.50
Allergy and Infectious Diseases Nursing Service	3,602.00	4,592.25
Arthritis and Metabolic Diseases Nursing Service	8,638.50	6,967.25
Cancer Nursing Service	28,281.00	24,543.00
Eye Nursing Service*	-	1,633.00
Heart Nursing Service	15,175.25	17,299.50
Neurology Nursing Service	12,047.50	12,645.50
Psychiatric Nursing Service	4,929.25	4,310.25
Education and Training (Orientation)	1,195.50	930.50
Total	74,125.00	74,096.75
Number of man days	9,265.62	9,262.09
Number of man years	35.50	35.48

* September 1, 1970 to April 30, 1971

Table 5
Number of Hours of Overtime by Service
May 1, 1970 - April 30, 1971

Nursing Service	May 1, 1970 to April 30, 1971
	Hours
Outpatient Nursing Service	1,514.00
Allergy and Infectious Diseases Nursing Service	1,414.25
Arthritis and Metabolic Diseases Nursing Service	1,930.25
Cancer Nursing Service	3,371.00
Eye Nursing Service*	222.50
Heart Nursing Service	1,586.75
Neurology Nursing Service	1,368.00
Psychiatric Nursing Service	1,434.50
Surgical Nursing Service	2,844.50
Central Nursing Office	1,069.75
Total	16,755.50
Number of man days	2,094.43
Number of man years	8.02

*September 1, 1970 to April 30, 1971

Table 6
Number of Hours of Overtime by Service
Fiscal Years 1970 and 1971
(For Comparison)

Nursing Service	1970	1971
	Hours	Hours
Outpatient Nursing Service	963.35	1,514.00
Allergy and Infectious Diseases Nursing Service	996.75	1,414.25
Arthritis and Metabolic Diseases Nursing Service	1,402.75	1,930.25
Cancer Nursing Service	3,390.75	3,371.00
Eye Nursing Service*	-	222.50
Heart Nursing Service	621.75	1,586.75
Neurology Nursing Service	1,166.00	1,368.00
Psychiatric Nursing Service	1,781.50	1,434.50
Surgical Nursing Service	2,389.75	2,844.50
Central Nursing Office	748.50	1,069.75
Total	13,461.10	16,755.50
Number of man days	1,682.63	2,094.43
Number of man years	6.45	8.02

*September 1, 1970 to April 30, 1971

Table 7
Total Hours of Nursing Care
and Average Number of Hours
of Nursing Care per Patient per Day
Provided by Each Nursing Service
May 1, 1970 - April 30, 1971

Nursing Service	Number of Patient Care Days	Professional Hours of Nursing Care *	Non-professional Hours of Nursing Care *	Total Hours of Nursing Care	Avge.Hrs. Nsg. Care per Patient per Day
Allergy & Infectious Diseases	12,420,00	26,878.50	20,008.75	46,967.25	3.78
Arthritis& Metabolic Diseases	15,306.00	42,587.00	36,221.00	78,808.00	5.15
Cancer	34,770.00	94,166.50	87,845.50	182,012.00	5.23
Eye **	3,377.00	9,340.50	2,249.75	11,590.25	3.43
Heart	24,372.00	72,748.00	52,639.25	125,387.25	5.14
Neurology ***	14,536.00	43,430.50	34,373.00	77,803.50	5.35
Psychiatry	14,910.00	55,247.00	46,478.00	101,725.00	6.82
Grand Total	119,691.00	344,398.50	279,894.25	624,292.75	5.21

* Includes Regular and Supplemental Staff
** Figures are for September 1, 1970 through April 30, 1971
***Figures include Eye patients May 1, 1970, through August 31, 1970.

Table 8
Accessions and Separations by Grade
May 1, 1970 -- April 30, 1971

Grade	Accessions	Separations
Commissioned Officers	5	6
Supervisory Nurse GS 11 and GS 12	2	5
OR, Psychiatric, and Clinical Nurse GS 9	8	28
Medical Technician and Heart Lung Machine Technician GS 5	2	-
OR, Psychiatric, and Clinical Nurse GS 7	81	61
Clinical Nurse GS 6	-	1
Nurse GS 5 and GS 4	19	6
Clerk-Typist GS 5, 4, 3, and 2	38	33
Practical Nurse GS 5, 4, and 3	12	18
Nursing Assistant GS 5, 4, 3, and 2 . . .	63	54
Total FY 1971	230	212
Total FY 1970 (For Comparison)	180	205

Table 9
Statistics, Operating Room
May 1, 1970 - April 30, 1971

Cardiac Catheterizations		Plasmaphereses	
	No.		No.
May	56	May	48
June	51	June	73
July	62	July	65
August	46	August	48
September	56	September	31
October	44	October	12
November	35	November	25
December	27	December	34
January	46	January	31
February	38	February	61
March	51	March	59
April	31	April	52
Total FY 1971 . . .	543	. . . . .	.539
Total FY 1970 . . .	597	. . . . .	.621

Number of Patients Going to Surgery
Classified by Institute

National Institute of Allergy and Infectious Diseases	61
National Institute of Arthritis and Metabolic Diseases	103
National Cancer Institute	628
National Institute of Child Health & Human Development	24
National Institute of Dental Research	5
National Eye Institute	76
National Heart and Lung Institute	390
National Institute of Mental Health	5
National Institute of Neurological Diseases and Stroke	346
Total FY 1971	1638
Total FY 1970	1491

Table 10
Diagnostic X-ray Procedures
Outpatient Nursing Service
May 1, 1970 - April 30, 1971

Month	Number
May	65
June	37
July	45
August	63
September	59
October	80
November	77
December	67
January	56
February	30
March	63
April	60
Total FY 1971	702
Total FY 1970	789

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CLINICAL CENTER

NUTRITION DEPARTMENT

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OBJECTIVES

The major objective of the Nutrition Department during FY 1971 was to meet the needs of the research investigators and at the same time provide quality food service to all patients. Technical and professional dietary services were requested by all Institutes represented at the Clinical Center. The Nutrition Department served as an integral part of the research studies to the fullest extent attainable within the scope of the most modern knowledge and techniques which are ever changing in the science of nutrition. The Department's program involved controlling patient dietary intakes, as ordered by research investigators, and providing investigators with precise and complete patient intake data.

In addition, this year the Nutrition Department provided consultation to dietitians throughout the United States and abroad in metabolic research and in therapeutic research dietetics. The professional staff shared the techniques in dietary management that have been developed at the Clinical Center.

CONTRIBUTIONS TO THE CLINICAL RESEARCH PROGRAM

Because of the research mission of the Clinical Center, the role of its nutrition department was necessarily unique. The Nutrition Department assumed responsibility for providing dietary services to support a wide variety of research programs and simultaneously carried the full responsibility for all food service to patients.

The many and varied dietary research services the Nutrition Department provided during fiscal year 1971 served two purposes: one, to assure the success of the study; and, two, to contribute to the patient's treatment. Examples of each are given below.

1. The success of the study was assured:

   a. By keeping the patient eating. This required catering to patients' likes and dislikes, cultural backgrounds, religious backgrounds, etc. (This is the primary role of food to the patient of the National Cancer Institute including those on balance studies and sterile diets.)

   b. By keeping a patient or volunteer patient happy in his environment and assuring a cooperative patient. The food service was adapted to the individual's eating patterns.

c. By assisting a patient to cope with his disease such as the surgery patients under the National Eye Institute, the National Institute of Dental Research, and the National Cancer Institute. These and others required changing consistency of food items and selection of food items to meet individual needs.

d. By providing the patient with typical food service even when he is ordered on isolation techniques.

e. By providing duplicate trays of food to the investigators for analysis.

f. By providing dietary instruction and counsel to patients going home on pass or leaving the hospital. (The greatest workload in this area was for those who were going on pass.)

g. By eliminating certain end products so that the investigator can measure the quantity of a given item in the urine or feces. (Diets free of catecholamines were used by the National Institute of Mental Health for this purpose.)

h. By providing food supplies for cooking to the National Institute of Mental Health for recreation experiences.

2. In addition to the above, diet served as a part of the patients' treatment. (This was often the case in diabetes and heart diseases.) None of the above is useful to the research programs unless the department is so managed as to provide:

a. "On-the-spot" items for specific studies, such as the recent purchase of fluid milk without vitamin D.

b. Delayed meals as necessary.

c. Specific test diets as they become indicated.

d. Direct contact with the patient daily, rather than depending on other departments to relay information to the dietitian and the need to be responsive to individual needs as they develop.

As indicated in the A. T. Kearney and Company report, the percentage of patients who required calculated and quantitative diets or other individual attention was much higher at the Clinical Center than in a "medical school teaching hospital." The following information was given after careful evaluation. They reported that:

"There are an unusually high number of special requirements ordered for patients served meals from each floor kitchen. They include:

(a) Check back trays where each food item is portioned and weighed at time of serving and the residue weighed after the meal. This category amounts to 24.4% of all diets served.

(b) Eight percent of all diets served require that foods not eaten be replaced.

(c) Almost one-third of breakfast meals are delayed for tests. This category compares to 17% experienced in general hospitals.

(d) One-fourth of the diets are changed daily."

Of all of the meals served in fiscal year 1971, 35.8% were classified as primary research tools, and would be prepared only by a clinical research unit at a medical school teaching hospital.

ACCOMPLISHMENTS, CHANGES, AND IMPROVEMENTS

Twelve floor kitchens, a "Laminary Flow" service kitchen, a formula room, the main kitchen, and the 3B (NCI) metabolic unit operated the full 12 months of the fiscal year 1971. The eighth floor (NHLI) metabolic kitchen and the ninth floor (NIAMD) metabolic kitchen operated only 11 months. (To reduce errors in the studies, these units were closed for a month for all staff vacations.)

Considered among the most important accomplishments of the Nutrition Department was the care and attention given to patients as individuals. Very ill patients were visited before each meal by Nutrition Department personnel and encouraged or coaxed to eat; diets were rewritten and recalculated to accommodate food preferences and whims of patients; new patients were interviewed by dietitians to assure that the patients' food preferences were allowed in their diets; special foods were purchased and served to encourage eating; the department covets the inherent ability of a hospital food service department to boost the morale of the patient.

In fiscal year 1971, the Nutrition Department served 369,933 meals. The department provided the following services for investigative purposes:

	Per Day	
	Maximum	Minimum
Patients with fluid intakes controlled	67	36
*Patients with food intakes calculated	78	41
*Patients with food intakes measured and replaced	117	67
Patients with trays held for tests to be completed	87	33

*This involves weighing at least three to six trays of food, and two to three nourishments for each patient.

The operation of the main kitchen to service the research programs required the provision of a wide variety of food items:

1. To assure the validity of the nutrition information furnished the investigator, the main kitchen operated with standardized recipes for each menu item and detailed specifications for each food item purchased.

2. One hundred twenty-five to 140 food items appeared on the selective menus each day. In addition to those offered on the seven selective menus, 8 to 10 hot food items and 40 to 53 cold food items were prepared twice a day to meet research needs.

3. Five hundred to 600 food items were maintained on the storeroom shelves to meet the variety of needs on short notice as well as daily needs.

The Nutrition Department gave individual discharge and follow-up diet instruction on 355 occasions.

One professional staff member was transferred to the National Heart and Lung Institute for the primary purpose of developing discharge instructions and group therapy training for patients and their families on the various types of hyperlipoproteinemia diets. It was anticipated that she would also participate in the intervention study to be undertaken by this Institute over the next two years.

The Nutrition Department also provided limited services to other departments and sections of the Clinical Center (Blood Bank, Patient Activity, Spiritual Ministry, Admissions and Follow-up, Employee Health, Occupational Therapy, Plasmapheresis Service, and NCI Radiology Service).

The department operated this year under the terms of the negotiated agreement between NIH and the AFGE, Lodge 2419 (April 25, 1970).

To provide flexibility and the best utilization of personnel, staff members along with the kitchen managers in the main kitchen were rotated in the Cooks' Unit, the Bakers' Unit, the Salad and Storeroom Units.

Limited staffing and a high level of absenteeism in fiscal year 1971 due to illness, court leave, jury duty, and daily emergencies, curtailed considerably the accomplishments, changes and improvements.

An analysis of the Department's labor hours shows an average of the following:

Number of meals served per labor hour worked	- .89
Number of meals served per labor hour paid	- .77

In-service educational programs using tape recordings furnished by the American Dietetic Association were begun for the professional staff. The programs were scheduled every three weeks. Former professional staff members (homemakers) living in the area and not working were invited to participate. Fifteen to 20 dietitians have attended each session.

Department personnel actively participated in the NIH Affirmative Action Plan. A staff member (cook) and the Chief of the Department served as EEO Clinical Center counselors throughout this year. Seven members of the staff participated in the adult education classes. Nine members of the Nutrition Department staff were selected for clerk-typist training.

As an outgrowth of the EEO program, the management staff of the Nutrition Department saw that there was a need for smaller information sessions in which people could obtain information and share information between professional supervisor and employee. It was determined that a calendar would be prepared for the Nutrition Department each month and posted on each bulletin board. Information sessions were developed as follows:

1. Information meetings were planned for two-way communications.

2. Each time the leader would have some specific items to review with the group, and it was hoped that they would suggest other items they would like to have discussed at the next meeting.

3. These meetings were not necessarily to be "gripe sessions," but problems should be called to the leader's attention.

A conference for experienced metabolic dietitians was held March 29-31. Eleven dietitians from ten medical teaching hospitals attended.

A survey of the Department was made by the A. T. Kearney & Company, Inc. The report stated:

1. The Clinical Center is not a hospital in the usual sense.

2. In practice, the Department provides a high quality of service, in terms of the support given the Institutes performing clinical studies, as well as the taste and appearance of patient food itself.

3. These practices and policies demonstrate the commitment of the Nutrition Department to optimum food service.

4. There is not much question that the nutrition data acquired in support of the clinical research studies represent a unique resource.

5. It is evident that quality is closely controlled.

6. The interviews conducted with clinical investigators indicated general satisfaction with Nutrition Department services. Often it was stated that the dietitian made a significant contribution to the research conducted at the Clinical Center.

MAJOR PROBLEMS ENCOUNTERED

The Nutrition Department's fluctuating and unpredictable workload continued to be one of its greatest problems. A wide variation occurred not only in total quantity served, but in the variety and degree of restrictions ordered. An even wider variation occurred in the types and kinds of diet requested. Clinical Center patients in general have been more gravely ill than those of previous years and have required more therapeutic diets for their medical care needs as well as more dietary adjustment as part of their treatment. The number of diet changes requested for individual patients continued at a high rate on nearly every service. This was a range from 96 to 73 diet changes each day of the year.

Although cost figures were available for this report only through January 1971, increases in patient ration costs are evident. Increases in wage schedules of all employees, as well as generally rising costs of raw food and other supplies, were contributing factors. Limited utilization of two of the three metabolic kitchens for balance study diets also contributed to the high cost of Clinical Center patient rations.

Patient Ration* Costs

Fiscal Year:	1966	1967	1968	1969	1970	As of 1/31/71
Personnel	$10.82	$12.34	$13.10	$15.10	$15.95	$16.63
Raw Food	1.91	2.11	2.27	2.56	2.81	2.89
Sup. & Other	.44	.40	.45	.54	.71	1.08
Average Cost per Ration	$13.17	$14.85	$15.82	$18.20	$19.47	$20.60

*A ration is defined as the equivalent of three meals served, not patient day.

The Kearney report analyzed the differences in food service costs between the Clinical Center and the "Median Costs of 70 Teaching Hospitals in the United States" and pointed out the following differences:

Clinical Center wage rates are higher than teaching hospitals.
Occupancy rate (67%) is lower than planned (75%).
No part-time help is employed.
Research kitchens are used extensively.
Higher food and supply costs exist because of the research needs.

The number of personnel needed to provide research food service to patients was extremely high in all areas of the Department. The workload was no less on weekends and holidays than on weekdays. The requirements for the service at the evening meal were as great as at the noon meal.

Since the majority of the diets were weighed or measured and accurate records kept of actual intake, more staff members were required in the nonprofessional categories than would be common in a hospital giving general medical care. Failure to provide adequate employees to cover long-term illness and a number of staff who had been out awaiting medical retirement in the nonprofessional category meant that the specially trained staff (dietitians) were not free in some cases for conferences and planning of diets required by the medical staff. Also, this reduced patient contact and endangered the general morale of the professional staff, which increases potential turnover at this level.

The Nutrition Department's formal training program for nonprofessional supervisors was eliminated in fiscal year 1971 because of the shortage of professional staff members and also the limitations on coverage of the nonprofessional supervisors.

There were a number of problems due to the personnel freeze and the personnel reclassification undertaken as a result of new standards for food service

workers, cooks, and bakers issued by the Civil Service Commission. The fact that no decision has been reached concerning this created more of a morale problem than if a decision had been reached well over a year ago. As a result, morale was lowered and caused considerable unrest and undercurrents that curtailed the efficiency of the units.

Purchasing in general presented many problems due to: (1) company mergers which in turn eliminated without notice some essential products; (2) changes in members of the Purchasing Department staff who had to be trained in the procedures of the department; (3) changes in purchasing delegation procedures; (4) strikes--making procurement of some items almost impossible; (5) changes in food packaging and quality standards.

PUBLICATIONS

Levy, R., Bonnell, M., and Ernst, N.: Dietary management of hyperlipoproteinemia. J. Am. Diet. Assoc. 58: 406-416, 1971.

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The Pharmacy Department is composed of 4 specialized Services plus the Office of the Chief.

PHARMACY SERVICE

1. The Pharmacy Service was responsible for:
   a. Filling drug requisitions for inpatients
   b. Filling prescriptions for both inpatients and outpatients
   c. Extemporaneous compounding of all intravenous additive solutions used in the Clinical Center
   d. Bulk compounding of noncommercially available formulations of drug products

2. Pertinent Statistics

   a. Number of daily intravenous additive orders compounded increased 19.4% over last year, and increased 71.4% over the last 3 years (from 1968: 23,712 to 1971: 40,648)
   b. Total number of daily bottles of intravenous additive solutions compounded increased 32% last year
   c. Followup patient prescriptions workload increased an average of 19% per year over the past 4 years
   d. Number of requests for the O.D. service increased 32% from 1969 to 1970

3. Major Problems, Changes, and Improvements

   a. With reference to the total number of daily bottles of intravenous additive solutions increasing by 32% in 1970, an impossible situation resulted with our present short staff in the Pharmacy Service. Therefore, a major change in the method of filling an intravenous order was instituted in late 1970. Instead of preparing several identical bottles to be administered at intervals over a 24-hour period, where it was possible, a single bottle was mixed with a 24-hour supply of solution. The solution was then administered on the nursing unit at certain time intervals by means of a burette chamber set hanging below the solution bottle. This change in procedure resulted in a 31% decrease in the number of bottles prepared by the intravenous additive area in 1971--bringing us back to our 1969 figure for bottles mixed, even though the number of daily orders and drugs used increased 18% over last year.

If this had not been done, it would have required almost 100,000 bottles.

It should be noted that the staffing pattern for the intravenous additive area has not increased since its inception in 1964, although the number of daily intravenous orders has more than doubled and the number of I.V. bottles has increased 130% from 1965 to 1970. This area has been able to survive only by the constant borrowing of pharmacy help from other areas in the Service, thus leaving other areas at times with poor or inadequate coverage.

Additional help was obtained for the intravenous additive area by means of the pharmacy officer of the day who prepared all intravenous orders from 5 p.m. to 8:30 a.m. The number of requests for the O.D. service increased 55% over the last 5 years.

b. Another major problem occurred in March 1971 when the FDA ordered all hospitals to discontinue the use of Abbott Laboratories' intravenous solutions because of potential infectious organisms in the cap liners of a large number of infusion bottles. This required an immediate switch to another company's infusion solutions with the need to recall every infusion bottle throughout the hospital. It also required a tremendous educational program to the nursing and medical staff on the use of the new Cutter system. The Cutter infusion bottles are a closed system as compared to the Abbott open system "screw-cap" bottles.

Thus, what could be done with an open system was literally impossible to do with the Cutter closed system. This created and required drastic changes in the ordering, preparing, and administering of the intravenous solutions. No longer was it possible to unscrew a bottle cap under sterile conditions in a laminar airflow hood and "pour down," easily add to, and precisely tailor the intravenous order to the physician's exact request. Also, small size volumes of intravenous infusion solutions are not manufactured by Cutter--thus requiring the patients to receive larger amounts of fluid than was previously to be given in the current protocols (such as POMP's). Unless this is corrected in the future, fluid administration times will be increased by 100% in the busy clinics and on many nursing units throughout the hospital.

The need for special procedures in the manipulation of solutions with the closed Cutter system, and the increase in extemporaneous compounding time in the intravenous additive area necessitated extra help during the week and doubling the staff on weekends. Additional help was requested, but as to date the only help permitted is part-time WAE help--the type which no professional person would readily want.

4. Accomplishments and Significant Contributions

a. Conducted on-the-job training of pharmacy technician trainee
b. Prepared procedural manuals for the handling of narcotics in the pharmacy and on the nursing units; and handling of employee prescriptions and all outpatient prescriptions in general
c. Trained 16 pharmacy residents from other USPHS hospitals, each for 2-week periods in the Pharmacy Department. The training in the Pharmacy Service involved instruction and practical experience in the extemporaneous compounding of intravenous additive solutions, compounding of non-commercially available formulations and discussions and lectures on the administration and technical problems encountered in the Pharmacy Service, particularly with reference to drug distribution.

5. Proposed Future Objectives

a. Involvement in a new drug distribution system for the Clinical Center
b. Unit dose packaging of drugs
c. Involvement in the organization, use, etc. of the drugs on the cardiac arrest carts
d. Updating of the Pharmacy Department Catalog--containing drugs and central sterile supply items stocked in the Pharmacy Department

CENTRAL STERILE SUPPLY SERVICE

1. The Central Sterile Supply Service was responsible for processing and issuing sterile and clean supplies used in the administration of medications, treatment of patients, research projects, and developmental activities in the various patient areas, specifically:

a. Sorting, cleaning, and inspecting reusable supplies and instruments; assembling and wrapping trays and sets
b. Linen processing which involved the preparation of sterile surgical packs and the distribution of clean surgical linen
c. Sterilization of packs, trays, sets, instruments, utensils, etc.
d. Storage and issue of clean and sterile commercially available disposable supplies and reprocessed supplies and instruments
e. Storage and issue of equipment for loan

2. Pertinent Statistics

a. In 1971, 20,000 requisitions were filled for a total of 3,000,000 items. Included in these items were the production of 16,380 trays and the distribution of 29,239 fluids, both for irrigation and intravenous infusion.
b. Filled requisitions represented a 5% increase over 1969 while distribution of fluids represented a 40% increase. Tray production revealed a 10% decrease from 1969.
c. In the past year, Central Sterile Supply lost 8 employees (with 2 years or more experience) representing a 25% loss in the service.

3. Major Problems, Changes, and Improvements

a. Comments with reference to the above statistics:
The 40% increase in fluids was probably due to excess use of irrigation fluid being used in cold mist vaporizers, most of which were used by the NIAMD Service. Pharmacy Department is presently looking into why sterile water is needed for these vaporizers. The testing of several vaporizers utilizing sterile water indicated a significant level of microorganisms even after 1 day. Thus, the addition of further sterile water to the vaporizer is of no value unless a clean, sterilized vaporizer is used every other day.

10% decrease in trays was attributed to the use and conversion to more disposable items and trays. This decrease was offset by processing activities in areas such as laminar flow and needles where multiple handling of special needles, syringes, and linens were quite time-consuming.

b. A new problem arose in the Central Sterile Supply since the NIH Laundry no longer has facilities for sewing special linen. All linens were submitted to an outside contractor and delays of up to 120 days and incorrectly sewn items were not uncommon. Therefore, we had to carefully plan ahead so that sufficient quantities of linens were on hand. However, this created a space and storage problem. The X-Ray Department used 30% of the total quantity of misty green linen. If this department could use (some) disposable gowns or simple packs, relief would be had by the surgery packaging area of Central Sterile Supply. Negotiations with the X-Ray Department are being arranged.

c. Central Sterile Supply discontinued repairing loan equipment, except for a few blood pressure sets (apparatus). However, all loan equipment was returned to the Central Sterile Supply where it was inspected and sent to the Clinical Center Instrument Shop for repairs if needed, and then to the Central Sterile Supply storage area for issue.

d. Central Sterile Supply was able to satisfy the needs of the Cath Labs with an American made 3-way stopcock manufactured by B-D. Previous use of the German made Propper 3-way stopcock involved long delays and costly repairs.

e. The major problem in Central Sterile Supply was with personnel. During the past year, the Central Sterile Supply lost 8 employees (with 2 years or more experience) representing a 25% loss in the service. Of these lost, 5 went on to upper mobility training (clerk-typist), 1 went to another service in the Pharmacy Department, 1 to another Clinical Center department, and 1 retired on disability. In addition to these losses, 4 persons were out on extended leave (more than 45 days) due to illness. It is expected that a minimum of 2 more employees with service greater than 2 years will be lost

to computer training programs. Several vacancies were filled with walk-in type employees who were not on the Civil Service register. Such persons do not stay very long because they either fail to be certified by passing the Civil Service examination or are looking for interim employment until they find what they want. Those on the register do appear to stay longer, but the number is very few.

Loss of personnel was due to the grossly underpaid salaries in the Central Sterile Supply. The average employee can go only as high as a grade 3 (which is equivalent to a Wage Board level 2). Many of our most experienced workers are in the 10 step of a grade 3 and have been with us for 15 years or more.

The loss of personnel adversely affected the workload situation in the Central Sterile Supply requiring constant training which must take place under active workload situations, and thus making more work for the remaining staff left behind. Another problem created for the Service was the lag between separation and recruitment which results in constant manipulation of schedules and increased number of unscheduled weekend assignments.

f. The change to Cutter solution sets greatly affected the workload in the Central Sterile Supply since all solutions are ordered by, stored by, and issued by the Central Sterile Supply Service. The staff is to be complimented on their converting the orders and requisitions over to Cutter products. A good knowledge of both lines of products was required so that suggestions and substitutions could be made rapidly and effectively.

4. Accomplishments and Significant Contributions

a. In spite of all the problems mentioned, the completion of the total renovation of the Central Sterile Supply, and a loss of 25% of the staff, our greatest achievement was holding the Service together and making it work.

Completion of the renovation meant moving everything in the Service once more for a total of 3 different moves for each item. All functional units are in place; however, many items of the type used once or twice a year are still scattered about. The assembly of these items will continue for some time in the future. The staff was commended by a cash award for its outstanding cooperation and continuous effort and service throughout the entire reorganization.

b. Many new disposable items were acquired during the year, such as lumbar puncture trays, Shilley trachea tubes, vaginal irrigation trays, and disposable whistle tip catheters with tip control.

c. A number of trays were revised and updated, such as the cardiac resuscitation trays, etc.

d. The problem of rusty instruments was resolved by changing from a liquid detergent to a solid one.

e. Our sterilization monitoring procedures were altered and updated. This involved changing from a bio-indicator requiring media and aseptic technique to a self contained bio-indicator with media enabling the monitoring to be done by one person.

f. An exchange cart system was tried and found extremely successful on nursing unit 10-East.

5. Proposed Future Objectives

a. Expand the concept of the exchange cart system on as many nursing units and outpatient clinics as possible.

b. Reduce the use and number of glass syringes while the number of disposable plastic syringes increases in the Clinical Center.

c. Centralize and issue all loan equipment through the Clinical Center Transportation Unit, thus alleviating storage and issue of the equipment from the Central Sterile Supply Service. The Central Sterile Supply will, however, still be responsible for receiving the return equipment, cleaning or repairing it, or having the Instrument Shop repair it prior to issuing it back to the nursing units from the Clinical Center Transportation Unit.

d. Continue further negotiation with NIH Central Stores with reference to the stores ordering, storing, and issuing all items that do not require processing or cleaning, such as irrigating solutions, sets, etc.

e. Re-evaluate the present Central Sterile Supply inventory and update or weed out unnecessary and obsolete items.

RADIOPHARMACEUTICAL SERVICE

1. This Service has 3 areas of responsibility: service functions, research and product development, and control.

a. Service functions included those procedures which were generally routine, such as a formulation technique in which a radioactive chemical was dissolved in a suitable solvent, sterilized, and packaged, or in other cases a simple aseptic dilution of a commercially procured radiopharmaceutical.

b. Research and product development activities involved originating radiopharmaceutical products for specific diagnostic and tracer studies.

c. Control functions were concerned with a variety of observations, tests, and analyses in which a product, regardless of its origin,

was submitted to establish its pharmaceutical or medicinal quality and at times to determine its efficacy.

2. Pertinent Statistics

a. Number of work units increased 35.6%.

b. Approximately 65% of the work requests were for the Nuclear Medicine Department, and the remaining 35% for licensed clinical investigators from the various institutes.

c. The work day for one of the pharmacists in the Radiopharmaceutical Service was changed to begin at 7:30 a.m.

3. Major Problems, Changes, and Improvements

a. Comments with reference to the above statistics:
A 36.6% increase in the number of work units was attributed to additional quality control procedures employed, such as spectrophotometric determinations of aluminum breakthrough from ^{99}Mo - $^{99}Tc^{m}$ generators, microscopic determination of particle size on colloids and aggregated suspensions, and increase in the number of chromatographic procedures for formulated products.

Work day starting at 7:30 a.m. for one of the pharmacists was the result of many requests made by the Nuclear Medicine Department for early arrival of the routine formulated products.

b. The Radiopharmaceutical Service, located in Building 21, continued to be very suitable as a work area, but was somewhat inconvenient for the clinical investigators because of the necessity for them to get from Building 10 to Building 21. However, arrangements were made for delivery and pickup of the finished product in Building 10 for the requesting physicians.

c. The present Nuclear Medicine staff consists of 2 physicians and 3 technicians. As of July 1, the staff will more than double to 4 or 5 physicians, 4 technicians, and one physicist. Since approximately 65% of our work requests are for the Nuclear Medicine Department, we can anticipate a huge increase in our workload. To date, no additional personnel were proposed for the Radiopharmaceutical Service.

4. Accomplishments and Significant Contributions

a. A special procedure for the labeling of ^{51}Cr platelets injection was initiated during the year. Excellent results were obtained when the injection was used for the measurement of platelet survival on patients with platelet abnormalities.

b. The following special formulations were developed and used:

(1) ^{67}Ga Citrate Injection to determine the incidence of uptake in known cases of lymphoma and carcinoma of the lung.
(2) ^{84}Rb Chloride Injection in myocardial scanning.

5. Proposed Future Objectives

a. Undertake new formulation and product development of the following:

$^{99}Tc^{m}$ HSA Macroaggregated Injection (Lung Scanning)
$^{99}Tc^{m}$ Red Blood Cells (Spleen Sequestration)
$^{99}Tc^{m}$ DTPA Injection (Kidney Scanning)
^{18}Fluorine Injection (Bone Scanning)
$^{99}Tc^{m}$ HSA Injection (Electrolytic Method (Various)
$^{99}Tc^{m}$ Platelet Injection (Spleen Sequestration)

b. Conduct a residency and post graduate program (3 months) for graduate radiopharmacist from the University of Southern California.

c. Jointly conduct research projects with the Nuclear Medicine Department on formulated products requiring bench work development and in vivo testing.

PHARMACEUTICAL DEVELOPMENT SERVICE

1. Responsible for:

a. Registration and control of investigational drugs.
b. Formulation and development of clinical dosage forms.
c. Assay and quality control of investigational drugs and formulated products used in patients.
d. Preparation of analytical data sheets for submission to FDA and DBS.

2. Pertinent Statistics

a. 23% increase in work requests.
b. 118% increase in the number of units formulated, developed, and issued.
c. 44% increase in the number of double-blind studies prepared and issued.

3. Major Problems, Changes, and Improvements

a. Comments with reference to the above statistics:
A 118% increase in the number of units developed and issued was due to the acquisition of an automatic capsule filling machine. This machine enabled the PDS to undertake capsule projects that formerly were not possible because of the large number of capsules required by the clinical investigator. For example: 100,000 capsules of two different strengths of L-dopa (not commercially available) were manufactured; 110,000 capsules of different strength of zinc sulfate were produced for the National Heart and Lung Institute's single

and double blind taste studies.

b. As of August 1970, Chief of the Pharmaceutical Development Service became Chief of the Pharmacy Department. This left a void in the operation of the Pharmaceutical Development Service that has not been filled to date. The Chief of the Pharmaceutical Development Service being also the Chief, Pharmacy Department, was not able to give the full attention and concentration needed by the Service although a staff pharmacist in charge of the day-to-day operation did report to the Chief for supervision and direction as the need required. Future recruitment is absolutely necessary for a Chief of the Service.

c. Plans for renovation of the formulation and product development area were submitted last year. To date, the job has not been scheduled--other than to say it will be considered in the 1972 fiscal year. The absolute need for the area to have walls, lighting, and proper air filtration is absolutely necessary, especially in view of the steady use of the automatic capsule filling machine which creates dust and drug particles in the air. This is both a health hazard and a house cleaning problem.

4. Accomplishments and Significant Contributions

a. The automatic filling machine enabled the Pharmaceutical Development Service to undertake many projects that were not possible in the past--if only due to the production of large number of capsules required.

b. A number of special and involved double-blind studies were prepared:

CCNU Psoriasis Study
Methadone Study
Migraine Study
Rheumatoid-Arthritis-Cytoxan Study
Sansert Study
Taste Study
Zinc-Hypogeusia Study

c. A Sodium Fluorescein in Agar was developed and successfully used for iontophoresis studies carried out by the NCI. The formulation of this product was unique in that the dosage form was a sterile gel packaged in a syringe ready for direct administration.

d. A number of individual clinical investigators requested analytical data sheets for their products for submission to the FDA and in compliment of their IND. This was different from the normal request received by clinical investigators for projects submitted to the Medical Board for approval.

e. Drug Fact Sheets containing pertinent data for the nurse and physician on all new investigational drugs used on their particular service and institute in the Clinical Center were prepared and

issued during the year. This was accepted with great enthusiasm and success. Now that the mechanism has been set up, this will be an ongoing service of the PDS.

5. Proposed Future Objectives

   a. Increase the number of long range stability studies being performed.

   b. Undertake the development of more specialized dosage forms such as sustained release dosage forms.

   c. Maintain better records on individual patients receiving investigational drugs. This possibly could be realized with the receipt of a copy of the physician's order sheet in the pharmacy.

OFFICE OF THE CHIEF

1. Management of the Department during the fiscal year was constantly challenged by the necessity of devising methods and policies for streamlining and rendering more efficient the overall Pharmacy Department operation in order to continue to provide adequate service to the patient care areas. This task became increasingly more difficult in view of the increasing demands on the Department's reduced personnel and resources. In spite of the many problems and difficulties created by the demands for service on an already overburdened production force, the Department was successful this year in its efforts to maintain its high standard of quality service.

2. Procurement of drugs during the past year has increased approximately 50%. In addition to the strain this increased expenditure has placed on the funds budgeted by the Clinical Center, it also imposed substantial burdens on the staff assigned to drug procurement and handling functions in the Office of the Chief.

3. On several occasions during the year, the Pharmacy Department was required to provide statistical data for congressional committees about drug purchases and usages in the Clinical Center. This data often times was not available in an easily retrieveable form, thus requiring many days of searching through records, receipts, etc. Better methods of obtaining this data will be needed in the future--such as maintaining a copy of the physician's order sheet, patient profile, realistic workload figures on units, individual patient records for controlled drugs, etc.

4. In the past year a new department chief was appointed. During the period of transition, continuity of management in the administration and operation of the Department was maintained with a minimum of difficulty.

5. Recruitment of professional personnel from the commissioned corps for the varied and unique pharmacy positions in the department posed no

particular problem this year. It should be mentioned, however, that future receuitment resources will not be as readily available with our new draft lottery system. The department may be required to rely on the Civil Service system and other personnel systems.

6. The Pharmacy Department's one pharmacy assistant trainee is working out very well. The continuation of this training slot as a means of providing trained pharmacy assistant personnel is absolutely necessary. If at all possible, this trainee program should be expanded in number due to the current trend and future needs of more pharmacy assistants.

7. This year, as in recent past years, the overriding problems faced and dealt with by the department management was how to satisfy increased demands for service output with inadequate personnel resources.

PROFESSIONAL ACTIVITIES

Edgar H. Adams

Laboratory instructor, Radiological Health Course for Pharmacists, February 1971

Troy D. Ballew

Attended Amsco Professional Seminar on Central Service Department, Erie, Pennsylvania, October 1970

Robert P. Chandler

Faculty member, Radiological Health Course for Radionuclide Users, October 1970
Laboratory instructor, Radiological Health Course for Pharmacists, February 1971
Lecturer at a teaching session, Society of Nuclear Medicine Mid-eastern Chapter annual meeting, Georgetown University, March 1971

Raymond J. Farkas

Attended Annual Meeting of the Society of Nuclear Medicine in Washington, D. C., July 1970
Faculty member, Radiological Health Course for Radionuclide Users, October 1970 and May 1971
Faculty member, Radiological Health Course for Pharmacists, February 1971
Attended American National Standards Institute Subcommittee meetings in Rockville, Maryland, March 1971

Joseph F. Gallelli, Ph.D.

Member, Chemotherapy Contract Review Committee, 1970-71
Contributing Editor, Drug Intelligence, 1970-71
Reviewer for the Journal of Pharmaceutical Science, 1970
Recipient of the 1970 Abbott Award of the American Society of Hospital Pharmacists for Outstanding Contribution to the Scientific Pharmaceutical Literature in the Field of Hospital Pharmacy

Paul K. Hiranaka

Attended 9th Annual Meeting of the American Pharmaceutical Association Academy of Pharmaceutical Science, Washington, D. C., 1970

Thomas H. Hodges

Faculty speaker, Institute on General Practice of Hospital Pharmacy, conducted by American Society of Hospital Pharmacists at West Point, N. Y., September 1970
Attended Federal Pharmaceutical Services Seminar, Washington, D. C., December 1970

Thomas H. Hodges (Cont'd.)

Attended annual meeting of the American Pharmaceutical Association, San Francisco, California, March 1971

Larry M. Kleinman

Attended 9th Annual Meeting of the American Pharmaceutical Association Academy of Pharmaceutical Science, Washington, D. C., 1970

Leonard C. Sisk

President, District of Columbia Society of Hospital Pharmacists
Vice-Chairman, Pharmacy Section, Association of Military Surgeons
Program participant, Federal Pharmaceutical Services Seminar, Washington, D. C., December 1970

James L. Snowden

Chairman, Metropolitan Washington Chapter of Central Service Personnel, 1970-71
Attended Management Training Course, Clinical Center, NIH, January 1971

Joseph A. Tangrea

Attended 9th Annual Meeting of the American Pharmaceutical Association Academy of Pharmaceutical Science, Washington, D. C., 1970

PUBLICATIONS

Dresback, D. S., and Gallelli, J. F.: Quantitative analysis and stability of 5(or 4)-[3,3-bis (2-chloroethyl)-1-triazenol] imidazole 4(or 5)-carboxamide in acidic aqueous solutions. J. Pharm. Sci. 59: 1829-1833, 1970

Table 1

Pharmacy Department Statistical Data

	1967 (Fiscal)	1968 (Fiscal)	1969 (Fiscal)	1970 (Fiscal)	Est. 1971 (Fiscal)
PHARMACY SERVICE					
Outpatient prescriptions	22,747	27,011	34,413	39,052	40,490
Inpatient prescriptions	13,987	11,816	3,179	2,741	4,510
I.V. additives (bottles)	41,174	46,522	55,912	72,982	*55,000
Drug vials reconstituted by I.V. Additive Service	42,662	42,786	56,154	62,876	60,000
Other items	248,922	254,911	239,996	256,424	260,000
Prepackaged items	56,684	47,531	42,094	41,191	45,000
Total	426,166	430,577	431,748	475,266	465,000
PHARMACEUTICAL DEVELOPMENT SERVICE					
Units developed and issued	51,740	111,306	155,896	174,079	381,404
Requests processed	1,403	1,318	1,301	1,146	1,414
Investigational drugs registered	410	403	447	500	412
New investigational drugs processed	93	126	113	101	100
RADIOPHARMACEUTICAL SERVICE					
Work units	8,934	10,735	9,019	8,840	12,000
Requests processed	2,227	2,263	1,682	1,502	1,535
PHARMACY OFFICER OF THE DAY					
Number of requests for service	4,624	4,545	5,395	7,158	5,000
MAIL-OUT PRESCRIPTIONS					
Number of prescription packages mailed	668	778	833	828	800

Table 1

Pharmacy Department Statistical Data

*Decrease in number of I.V. bottles was due to new method of filling I.V. orders for drugs used in intermittent I.V. therapy. This resulted in preparation of larger volumes per bottle, but lesser number of I.V. bottles.

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES

REHABILITATION DEPARTMENT

CC-38
Serial No.

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PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

REHABILITATION DEPARTMENT

CC-38
Serial No.

INTRODUCTION

During the period July 1, 1970, through June 30, 1971, as in previous years, the Rehabilitation Department performed its basic function of patient treatment, using recognized, effective measures of physical and occupational therapy. Again, a large number and wide variety of tests and measurements were carried out for Institute physicians primarily in evaluation of functional ability and progress, but also in connection with diagnosis and determination of effectiveness of drug and other therapy.

SERVICES PROVIDED BY THE REHABILITATION DEPARTMENT

Physical Therapy Service

1. Tests and measurements:
   - Manual muscle evaluation
   - Quantitative muscle testing
   - Joint range of motion measurements
   - Electrodiagnostic testing, including chronaxie measurements and strength-duration curves
   - Self-care evaluation (activities of daily living)
   - Progressive resistance exercise evaluation
   - Pulmonary function studies
   - Girth, length, and volumetric measurements
2. Heat, including:
   - Superficial--hot packs, infrared, paraffin bath, whirlpool
   - Deep--shortwave diathermy, microwave, ultrasound
   - General body heat--Hubbard tank
3. Therapeutic exercise:
   - General exercise--passive, active assistive, active, and resistive
   - Muscle re-education
   - Ambulation training
   - Pre- and postoperative thoracic surgery program
   - Pre-prosthetic, and prosthetic training
   - Training in self-care activities
   - Breathing exercises and postural drainage
4. Miscellaneous
   - General and local application of ultraviolet light
   - Cervical traction
   - Pelvic traction
   - Application of splints and casts to maintain joint in good anatomical and functional position

Instruction to patients and family in home care program (application of heat, exercise, use of self-care aids)
Fitting and dispensing canes and crutches
Prescription and procurement of correct shoes, braces, corsets, splints, and prostheses

Occupational Therapy Service

1. Physical and functional restoration:
   Maintain or regain joint range of motion
   Increase muscle strength
   Improve coordination
   Develop work tolerance
   Train in activities of daily living
   Train in development of substitute skills (visual loss)
   Train upper extremity amputee in use of prosthetic device
   Make splints and provide self-care aids

2. Evaluation and testing:
   Activities of daily living, including self-care and homemaking evaluation
   Evaluate children's developmental levels
   Record patient's behavior patterns for use in evaluation of patient's reactions in specific research studies
   Pre- and postoperative performance tests for stereotaxic patients
   Periodic functional activity tests of patients on drug studies

3. Psychological adjustment:
   Substitute constructive interests for the insecurity and anxiety which may develop during research studies
   Provide normal developmental learning experiences for children
   Promote relaxation and acceptance of bed rest
   Aid in resocialization

4. Psychiatric adjustment:
   Provide activities in relation to needs of research studies and report observations of patient's behavior
   Aid patient in making acceptable social adjustment
   Aid patient in preparing for community living and carrying employment and home responsibilities
   Place patient in industrial therapy program as a step toward post-hospital employment

5. Prevocational exploration:
   Explore skills, interests, and work habits
   Increase work tolerance
   Maintain special skills required by patient's job
   Make recommendations on patient's performance and aptitudes for use in vocational planning

Office of the Chief

1. Evaluation of Institute patients referred for physical medicine and rehabilitation; prescription and supervision of therapy
2. Electromyography, including conduction velocity, and repetitive stimulation studies
3. Speech consultation

PROGRAM DEVELOPMENT AND CHANGES

Continuing Programs

1. As reported last year, we found that casts and splints made from Lightcast®, a resin-impregnated fiberglass bandage, are very light in weight and more durable than those made from plaster of paris. Use of this new material has two disadvantages: application is much more time consuming, and its strong odor is noticeable and irritating in spite of special venting of the area where the material is used.

2. Evaluation and treatment of patients with cystic fibrosis included pulmonary function tests, bronchial drainage, breathing exercises, posture exercises, and instruction to parents or patients in a home treatment program. The total program included use of slant boards and hand vibrators described in last year's report which allowed the pre-teen and teenage patients to apply their own treatment at home and to be less dependent on other persons. Several slant boards and vibrators were purchased by the Pediatric Metabolism Branch, NIAMD, and were dispensed on loan by our Service to specific reliable patients of the age groups mentioned. Parents of smaller children have purchased their own equipment for the treatment application.

3. Pulmonary function tests were performed for patients having acromegaly, scleroderma, and hyposmia.

4. Pre- and postoperative evaluations and treatment of patients with spinal arteriovenous malformations were conducted. The preoperative program included manual muscle evaluation, quantitative muscle testing, and evaluation of functional abilities. Postoperatively, the program involved muscle re-education and strengthening exercises, joint range of motion exercise, transfer activities, and when feasible, ambulation and gait training with or without assistive devices and braces.
5. Patients with Parkinsonism or dystonia musculorum deformans on the L-Dopa study in NIMH were evaluated and treated in Physical and Occupational Therapy Services. Details of such evaluation and treatment were periodically reviewed with the NIMH Senior Investigator.

6. The Occupational Therapy Service continued to provide a supportive program for the patients in the Laminar Air Flow Room and expanded the program to care for the patients in the second room when it opened in March.

7. A supportive program for NCI children and adult patients on radiation or drug therapy on an outpatient basis or in SACP (Special Ambulatory Care Program) continued. The number of outpatients referred to Occupational Therapy increased this past year while the number on SACP remained at the high level it reached during the previous fiscal year.

8. The Occupational Therapy Service has continued to act as a consultant to the nursing staff of NINDS in making adaptations of protective helmets for individual children with cerebral seizures.

9. Electromyography, measurement of nerve conduction velocity, and repetitive nerve stimulation continued as services of the Rehabilitation Department. From July 1, 1970 through June 30, 1971 (April, May, and June are estimated), we saw 32 patients for the electromyographic study of a total of 78 muscles, 34 patients for measurement of conduction velocity of 139 nerves, and 3 patients for stimulation studies.

10. Dr. D. M. Fried, Chief, Rehabilitation Department, with Mr. Mario Salvanelli, Assistant Chief, Physical Therapy Service, presented a 2-hour lecture April 14, 1971, on Rheumatoid Arthritis emphasizing the concept of total patient care to the first-year class of the Howard University Medical School.

New Programs

1. Physical Therapy and Occupational Therapy Services have for many years utilized a number of pre- and post-operative tests developed with Dr. John Van Buren, NINDS, for patients having stereotaxic surgical procedures. Dr. J. Shapiro, NINDS, began a comprehensive evaluation of records of these patients which included our test results. Confirming our impressions, Dr. Shapiro concluded that certain tests done by the Physical Therapy Service (requiring 1 1/2 to 2 hours time) were not sufficiently meaningful in the over-all evaluation. To determine test validity, Dr. Shapiro arranged for Physical Therapy and Occupational Therapy Services to test approximately 40 NINDS normal volunteer out-patients, adults of both sexes. Certain tests and measurements were eliminated for this purpose with the remaining ones consuming about 30 minutes of test time per patient. It was determined by the Surgical Neurology Branch of NINDS that the abbreviated tests were valid, and relevant to the over-all evaluations. As a result, the procedures were adopted for testing 75 NINDS post-operative patients from February through April, 1971. Mrs. Mary Duncan, Physical Therapist, and Mrs. Louise Bezdek, Occupational Therapist, had major responsibility for the testing in their respective services.

2. Occupational therapy was provided for patients referred from NICHD since July 1970 when the Institute activated its beds.

Reduction in Programs

1. Loss of staff in Occupational Therapy Service through resignation or transfer was made permanent as a result of a new and lower personnel ceiling. This required cut-backs in established treatment programs for patients. The Arts and Crafts Clinic closes at 4 P.M. daily and all day Wednesdays. Certain modalities have been eliminated. Inpatient normal volunteers are no longer admitted to Occupational Therapy. Two NIMH nursing units were covered by one occupational therapist who also acted as consultant to a third NIMH nursing unit. When therapists were on leave, the programs they normally carried were cut drastically or closed entirely because of the limited staff remaining on duty. The reduction in programs is reflected in the statistical section of this report.

STAFF TRAINING

For Rehabilitation Department Personnel

1. Staff members attended medical ward rounds, conferences, and lectures conducted by Clinical Center and visiting medical staff.

2. Mr. Robert Massey, Physical Therapy Assistant, enrolled in the NIH Education Program arranged by Personnel Management, and attended classes four hours weekly.

3. In-service training for the Rehabilitation Department personnel included once weekly viewing of video-tapes prepared originally during in-service training for NINDS personnel. Subjects of the tapes included: The Neurological Examination, Stereotaxic Surgery, Anatomy and Physiology of the Eye, Needs of Hospitalized Children with Neurological Disorders, Head Injuries, Muscle Pathology, Cardiac Arrest, Parkinsonism and L-Dopa, Hydrocephalus and Shunts, Nursing Care of Patients with Amyotrophic Lateral Sclerosis, Psychological Testing, and Seizure Disorders. There are approximately 50 video-tapes in the entire series.

4. Mr. Mario Salvanelli and Mr. Lamont Smith, Physical Therapists, participated in Supervisor's courses given by the Clinical Center Personnel Office. Mr. Salvanelli and Mr. Smith will become Chief and Assistant Chief, respectively, of the Physical Therapy Service following Miss Niebuhr's retirement July 31, 1971.

5. Mr. Smith attended a one-week advanced course on Joint Manipulation at the Belmont Rehabilitation Clinic, Boston, Massachusetts, June 21-25, 1971, a sequel to the basic course taken two years ago.

By Rehabilitation Department Personnel

1. One educational course was conducted for practical nurses and nursing assistants by Mr. Salvanelli, Assistant Chief, Physical Therapy Service, on bed positioning, transfer activities, and posture and body mechanics in the nursing arts. Miss Beach presented lectures and demonstrations of occupational therapy for the chronically ill patients. These courses were not given as frequently as in the past, because the Nursing Education Service used the video-tape prepared during one of the courses by Messrs. Salvanelli and Smith.

2. Red Cross Hospital Volunteers orientation was conducted by Dr. Fried, Miss Beach, and Mr. Smith on the function and scope of the Rehabilitation Department programs and ways in which the volunteer services apply.

3. New Social Workers orientation was conducted by Dr. Fried, Miss Beach, and Mr. Salvanelli on the function and scope of the Rehabilitation Department programs and ways in which social work function is coordinated with our programs.

4. Monthly tours were conducted for new nursing service personnel through the Physical Therapy and Occupational Therapy Services with orientation regarding program function and scope.

PARTICIPATION OF PERSONNEL IN PROFESSIONAL ACTIVITIES OFF THE CAMPUS

1. Miss V. J. Niebuhr, Chief, Physical Therapy Service and Miss Mary Beach, Chief, Occupational Therapy Service participated in meetings of the PHS Therapist Career Development with Miss Beach continuing as Executive Secretary of the Committee. Miss Niebuhr and Miss Beach also served as panel members of the Washington Interagency Boards for Physical and Occupational Therapists, and Physical and Occupational Therapy Assistants, U.S. Civil Service Commission. Miss Niebuhr, in addition, served on PHS Commissioned Officer Boards.

2. Staff members attended scientific sessions of the annual conference of the American Physical Therapy Association, meeting in Washington, D. C., July, 1970.

3. Mr. Arthur Plumstead, Staff Physical Therapist, attended a 2-day workshop in Baltimore, Maryland, March, 1970, presented jointly by the University of Maryland and the State Health Department on Health Care Delivery.

4. Mr. Richard Hetherington, Staff Physical Therapist, participated in a one-day workshop on Chronic Respiratory Diseases held at Cumberland, Maryland, September, 1970. The workshop was attended by approximately 250 professional people from the four most western Maryland counties and northern West Virginia; it was sponsored by the western Maryland chapters of the Tuberculosis and Respiratory Disease Association. Mr. Hetherington spoke on "Physical Therapy for Respiratory Disease," and covered bronchial drainage, breathing exercises, respiratory endurance with exercise, and the use of slant boards and hand vibrators.

5. Mr. Plumstead also attended a one-day symposium during April, 1971, on Pulmonary Aspects of Surgical Care. The symposium was held at the National Bureau of Standards and was sponsored by area chapters of the Tuberculosis and Respiratory Disease Association.

6. Mrs. Judith Schreiber, Staff Occupational Therapist, attended the Annual Symposium at Chestnut Lodge, Rockville, Maryland, October 9, 1970.

7. Mrs. Louise Bezdek, Staff Occupational Therapist, attended the NINDS Symposium on Clinical Quantitative Neurological Examinations for Evaluation of Patients and Drugs, held at NIH, October 14, 1970.

8. Mrs. Bezdek was enrolled in the course "Upper Extremity Prosthetics Training for M.D.'s and Therapists," Prosthetics 662, at Northwestern University Medical School, Prosthetic-Orthotic Center, Chicago, Illinois, April 12-15, 1971.

9. Miss Ruth Singleterry, Assistant Chief, Occupational Therapy Service, attended the Annual Conference of the American Occupational Therapy Association, New York City, November 10-13, 1970.

STAFFING AND PERSONNEL CHANGES

Office of the Chief

1. Appointments: none
2. Resignations: none
3. FY 1971 Staffing Pattern:

Chief, Rehabilitation Department	1
Assistant Chief, Rehabilitation Department	1
Secretary	1
	3

Physical Therapy Service

1. Appointments:
   Mr. Richard Hetherington, SA Therapist, was transferred 7/1/70 to our Service from the former PHS Chronic Disease Arthritis and Diabetes Control Program.
2. Resignations: none
3. Retirements: none
4. FY 1971 Staffing Pattern:

Chief, Physical Therapy Service	1
Assistant Chief, Physical Therapy Service	1
Supervisory Physical Therapist	1
Staff Physical Therapists	4
Physical Therapy Assistant	1
Secretary	1
	9

Occupational Therapy Service

1. Appointments: none
2. Resignations:
   Mrs. Kathleen Corporon, GS-7, 11/14/70
3. Retirement:
   Miss Austina Mallory, GS-8, Occupational Therapist, 7/11/70
4. Transfer to Another Service:
   Mr. Otis L. Crutchfield, Jr., GS-5, Occupational Therapy Assistant, 7/12/70
5. FY 1971 Staffing Pattern:

Chief, Occupational Therapy Service	1
Assistant Chief, Occupational Therapy Service	1
Staff Occupational Therapists	5
Staff Occupational Therapist - vacancy	1
Occupational Therapy Assistant	1
Secretary	1
	10

PHYSICAL THERAPY SERVICE

Table 1: Statistical Report, by Month, Fiscal Year 1971 *

	No. of Working Days	No. of Different Patients Treated		No. of Patient Visits		No. of Treatments Given	
		IP	OP	IP	OP	IP	OP
July 1970	22	133	40	796	62	1505	123
Aug.	21	116	41	706	74	1119	164
Sept.	21	132	32	615	50	1034	95
Oct.	22	137	32	621	62	1164	120
Nov.	19	120	34	639	40	1174	80
Dec.	21	99	44	623	74	1185	112
Jan. 1971	20	120	35	536	68	1009	142
Feb.	19	103	33	588	80	1039	114
Mar.	23	127	43	834	88	1508	138
Apr.	22	123	43	988	92	1845	195
May	20	131	31	806	81	1538	174
June	22	130	30	857	81	1756	163
Total	252	1471	438	8609	852	15876	1620
Total		1909		9461		17496	

* Estimated for April, May and June

Table 2: Number of Different Patients Treated, by Months and Institutes, Fiscal Year 1971 *

MONTH	NHLI	NIAMD	NCI	NIAID	NINDS	NIMH	NIDR	NEI	NICHD	TOTAL
July 1970	14	29	47	23	52	6	-	2	-	173
Aug.	16	28	41	18	50	2	-	2	-	157
Sept.	22	42	33	12	52	1	-	2	-	164
Oct.	24	41	38	15	43	4	-	3	1	169
Nov.	22	33	36	16	43	3	-	1	-	154
Dec.	13	31	33	4	54	5	-	1	2	143
Jan. 1971	20	32	30	13	52	7	-	1	-	155
Feb.	13	20	35	13	46	9	-	-	-	136
Mar.	32	18	40	15	55	9	-	-	1	170
Apr.	21	43	40	13	44	5	-	-	-	166
May	21	32	49	6	46	8	-	-	-	162
June	17	23	54	11	45	7	-	3	-	160
Total	235	372	476	159	582	66	-	15	4	1909

*Statistics for April, May and June were estimated.

Table 3: Number of New Patient Admissions, by Institute; Comparative Statistics, Fiscal Years 1967-71 *

Fiscal Year	NHLI	NIAMD	NCI	NIAID	NINDS	NIMH	NIDR	NEI	NICHD	TOTAL
1967	152	307	225	33	410	3	-	-	-	1130
1968	140	274	264	46	328	4	1	-	-	1057
1969	175	236	256	47	322	15	3	-	-	1054
1970	164	236	290	85	322	29	1	-	-	1127
1971	176	251	338	119	415	32	-	10	4	1345

* Statistics for April, May and June were estimated.

Table 4: Comparative Statistics,
Fiscal Years 1967-71 *

Fiscal Year	No. of Different Patients Treated	No. of Patient Visits **	No. of Treatments Given ***
1967	1769	10,714 (2040)	20,883 (493)
1968	1668	10,378 (1704)	19,473 (442)
1969	1641	10,495 (1771)	19,254 (505)
1970	1730	11,170 (2084)	21,981 (427)
1971	1909	9,461 (1990)	17,496 (636)

* Estimated statistics for April, May and June

** Number of visit cancellations indicated in parenthesis

*** Number of single visits only indicated in parenthesis

PHYSICAL THERAPY SERVICE

Table 5: Percentave of Inpatients Treated (Average), Exclusive of NIMH, NIDR, NEI and NICHD **
Comparative Statistics, Fiscal Years 1967-71 *

Fiscal Year	NHLI	NIAMD	NCI	NIAID	NINDS	**ALL
1967	11.7	28.8	11.1	8.7	38.6	18.3
1968	7.7	27.8	13.0	11.6	32.1	16.8
1969	9.9	28.1	10.7	13.7	40.9	17.8
1970	10.4	28.5	11.9	14.4	39.2	18.0
1971	10.6	26.2	14.1	20.7	47.0	19.2

* Statistics for April, May and June were estimated.

PHYSICAL THERAPY SERVICE

Table 6: Consultant Visits,
Fiscal Year 1971 *

Orthotist: 46 visits for 75 patient examinations

Shoe Fitter: 26 visits for 36 patient examinations

* Estimated for April, May and June

PHYSICAL THERAPY SERVICE

Table 7: Number of Patient Evaluations by the Physiatrists, Fiscal Years 1967-71 *

Fiscal Year	NHLI	NIAMD	NCI	NIAID	NINDS	NIMH	NIDR	NEI	NICHD	TOTAL
1967	101	218	187	32	480	2	-	-	-	1031
1968	110	187	199	39	350	3	-	-	-	888
1969	66	178	199	46	337	14	2	-	-	842
1970	81	157	196	64	337	32	1	-	-	868
1971	69	167	204	72	332	27	-	5	1	877

* Estimated for April, May and June

OCCUPATIONAL THERAPY SERVICE

Table 8: Fiscal Year 1971
Number of Different Patients Treated by Months
and Institutes, including Outpatients and SACP *

	NCI			NEI	NHLI		NIAID	NIAMD		NICHD	NIDR	NIMH	NINDS		TOTALS		
	IP	OP	SACP	IP	IP	OP	IP	IP	OP	IP	IP	IP	IP	OP	IP	OP	SACP
July 1970	92	25	31	28	112	1	53	60		22		45	46	1	458	27	31
Aug. "	87	22	48	25	128		50	63		23		39	44	3	459	25	48
Sept. "	86	25	56	26	86		49	64	1	17	1	35	49	3	413	29	56
Oct. "	84	26	65	21	100		55	56	1	13	1	35	46	2	411	29	65
Nov. "	72	25	42	17	94		47	53		8		35	45	8	371	33	42
Dec. "	65	28	38	18	73		38	45		8		36	36		319	28	38
Jan. 1971	70	31	43	15	79		43	47		5	3	37	45	2	344	33	43
Feb. "	71	34	37	16	85		43	46		6	2	38	40	1	347	35	37
Mar. "	93	33	45	18	82		54	55		2		37	44	13	385	46	45
Apr. "	76	30	35	18	80		44	50		8	1	36	44	30	357	60	35
May "	80	28	40	23	85		42	53		10		35	46	30	374	58	40
June "	85	33	37	20	82		46	48		15	2	38	43	5	379	38	37
Totals	941	340	517	245	1086	1	564	640	2	137	10	446	528	98	4597	441	517

*Estimates for April - June 1971

OCCUPATIONAL THERAPY SERVICE

Table 9: Fiscal Year 1971
Patients Admitted to Occupational Therapy
including Outpatients and SACP *

	NCI			NEI	NHLI	NIAID	NIAMD		NICHD	NIDR	NIMH	NINDS		TOTALS		
	IP	OP	SACP	IP	IP	IP	IP	OP	IP	IP	IP	IP	OP	IP	OP	SACP
July 1970	49	5	17	16	54	24	28		1		20	29		221	5	17
Aug. "	37	3	33	7	61	23	26		6		8	26	2	194	5	33
Sept. "	53	7	42	10	44	32	29	1	8	1	6	26	1	209	9	42
Oct. "	42	7	43	5	59	31	25		6		10	29	2	207	9	43
Nov. "	44	8	29	5	48	31	24		5		8	25	7	190	15	29
Dec. "	32	6	27	5	39	14	22		3		7	21		143	6	27
Jan. 1971	41	8	36	5	67	32	29		4	3	10	32	2	223	10	36
Feb. "	35	7	22	7	52	21	16		3	1	10	18		163	7	22
Mar. "	60	4	31	8	54	34	27		2		9	34	12	228	16	31
Apr. "	44	8	23	6	53	30	22		5	1	10	24	2	195	10	23
May "	42	6	27	8	55	28	25		4		7	31	1	200	7	27
June "	40	7	33	5	49	32	28		6	2	9	28	2	199	9	33
Totals	519	76	363	87	635	332	301	1	53	8	114	323	31	2372	108	363

*Estimates for April - June 1971

OCCUPATIONAL THERAPY SERVICE

Table 10:Fiscal Year 1971
Summary Report by Institutes of Number of
Patients Treated, Number of Treatments and Hours *

Institutes	Number of Different Patients Treated			Number of Patient Treatments			Number of Treatment Hours		
	IP	OP	SACP	IP	OP	SACP	IP	OP	SACP
NCI	941	340	517	4388	430	1239	2506	418	1164
NEI	245			1160			1098		
NHLI	1086	1		3588	1		2269	1	
NIAID	564			2058			1494		
NIAMD	640	2		3132	1		2025	1	
NICHD	137			385			253		
NIDR	10			28			18		
NIMH	446			4871			8698		
NINDS	528	98		1807	120		1676	92	
Totals	4597	441	517	21,417	552	1239	20,037	512	1164

*Estimates for April - June 1971

Table 11: Comparative Statistics
Fiscal Years 1967 - 71
Patient Treatments and Treatment Hours *

Fiscal Years	Number of Different Patients Treated			Number of Patient Treatments			Number of Treatment Hours		
	IP	OP	SACP	IP	OP	SACP	IP	OP	SACP
1967	5,241	115	187	31,620	216	499	27,900	203	471
1968	5,148	189	254	29,497	391	611	26,867	329	587
1969	5,072	119	420	32,756	113	1,092	27,881	110	1,058
1970	5,243	194	466	26,520	230	1,045	21,019	219	1,016
1971	4,597	441	517	21,417	552	1,239	20,037	512	1,164

*Estimates for April - June 1970

OCCUPATIONAL THERAPY SERVICE

Table 12: Fiscal Year 1971
Percentage of Inpatients Treated *

	NCI	NEI	NHLI	NIAID	NIAMD	NICHD	NIDR	NIMH	NINDS	TOTALS
July 1970	46.9	90.3	61.8	84.1	80	90		72.6	66.6	65
Aug. "	45.2	86.2	70	72.4	77.7	85.1		67.2	55.7	63.8
Sept. "	41.1	89.5	53.1	79	86.4	56.6	100	67.3	62.8	60.5
Oct. "	42.2	75	57.8	84.6	82.3	54.3	100	74.4	65.6	60.9
Nov. "	42.3	68	60.2	65.3	58.2	28.5		58.4	58.3	54.6
Dec. "	37.3	64.3	60.3	58.5	57	33.3		61	46.2	50.7
Jan. 1971	36.2	78.9	53.7	61.1	69	20	75	57.8	56	51.8
Feb. "	38.2	88.8	48.8	59.7	66.6	4	100	67.8	48.7	50.7
Mar. "	46.5	78.2	48.5	60.6	66.2	7.1		63.8	44.8	52.1
Apr. "	38.3	75	55.2	60.3	70.2	23.1	75	55.4	54	52.8
May "	36.1	78.3	52	63.2	66.3	18.4	100	68.3	58.4	53.4
June "	37.4	81.3	54.5	65	68.4	24.3		59.3	55.2	55.3
Monthly averages	40.5	79.5	56.3	67.8	70.7	37	45.8	64.4	56	55.9

*Estimates for April - June 1971

Table 13: Comparative Statistics Fiscal Years 1967 - 71
Percentage of Inpatients Treated *

Fiscal Year	NCI	NEI	NHLI	NIAID	NIAMD	NICHD	NIDR	NIMH	NINDS	TOTALS
1967	54		71.7	45.3	79.9	100**	61.1	72	55.2	63.1
1968	47		72.7	47.7	74.6		82	88.8	66	62.8
1969	47.1		76.1	58.2	72.6		56.1	92.8	75.3	64.1
1970	47.9	86.4***	72.0	68.7	73.6		35.2	57.5	66.7	63.8
1971	40.5	79.5	56.3	67.8	70.7	37+	45.8	64.4	56	55.9

* Estimates for April - June 1971
** In FY 1967 NICHD July only
*** In FY 1970 Prior to April 1, NEI patients included in NINDS figures.
\+ In FY 1971 on July 1st, 21 patients in Occupational Therapy were transferred from NCI to NICHD

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

SOCIAL WORK DEPARTMENT

CC-39
Serial No.

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PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

SOCIAL WORK DEPARTMENT

CC-39
Serial No.

MAJOR TRENDS

The year was marked by considerable reorganization of staff responsibilities and reassessment of service priorities as the department attempted to maintain a high quality and volume of services despite the fact that it had the smallest staff complement authorized in the last 15 years. Following two resignations of professional staff members without replacement in July and August, the department reached its new lowered authorized ceiling of 18 full-time positions and completed a 1969 mandate to reduce staff size through attrition by 40 percent. Considerable personnel change occurred this year as there were five resignations by professional staff members and two clerical.

To enable the department to cope with its loss of personnel and still meet demands for service, it was necessary on most units to shift away from a former service policy of reaching out to all patients and families to a less intensive, more emergency oriented approach. Consequently, although service rendered was not always as complete or timely as desirable, it was still possible to provide social service to an average of nearly 77 percent of the inpatients present in the hospital each month (see Table 1). By way of contrast, the department had achieved an inpatient coverage figure of 89.4 percent in Fiscal Year 1969, and 87 percent in 1970. The burgeoning outpatient department generated a continuing high rate of referrals so that approximately the same number were provided with social work service as in previous years - an average of 155 outpatients each month (see Table 2). An average of 358 family members of in- and outpatients were provided with social services each month (see Table 2), a figure about 13 percent lower than last year, providing substantial testimony to the department's role in serving as a link between patient, hospital, and home.

In September, the department achieved a long-standing goal of becoming a field training unit for a local graduate school of social work. Starting with one student this year, it is hoped that we may be able to increase this number in the future and enable a larger number of staff members to enhance their practice through the assumption of teaching responsibilities.

In a year characterized by difficult economic conditions, rising living costs, and consequently a more distressed financial state among many of our patients and their relatives, expenditures from the Patient Welfare Fund

increased markedly to a projected estimate of $27,000 compared to $19,000 last year. Income was substantial at $16,000, but down about 37 percent from last year. While it is a matter of concern that expenditures exceeded income, nevertheless, the fund continued to be a very solvent operation. A comfortable balance carried over from the previous year insured that it will be possible to meet all reasonable requests for help in the coming year (see Table 4).

During this Fiscal Year, about 350 patients and relatives were assisted by the fund in meeting emergency situations when no other source of assistance appeared available. In a number of situations, it was clear that patients would have left the hospital against medical advice, or suffered severe emotional distress, had we not been able to support the presence of some family member here during a time of medical treatment crisis.

SOCIAL WORK SERVICES RENDERED

Number of Patients Provided with Service in Various Categories

Each month the department reports on the number of patients and their family members served in four principal categories: (1) Preadmission - services between acceptance for admission to a project and Clinical Center outpatient or inpatient admission; (2) Inpatient - person occupying a bed in the Clinical Center; (3) Clinic - person under outpatient treatment who has never been an inpatient; and (4) Follow-up - outpatient contact with former inpatient. A summary of monthly totals of patients provided with social work services for the first 9 months of Fiscal Years 1970 and 1971 is presented below.

SUMMARY OF MONTHLY TOTALS
OF PATIENTS SERVED

Service Categories	FY 1970 Patients Served July 1969 - March 1970		FY 1971 Patients Served July 1970 - March 1971	
	Number	% of Total	Number	% of Total
Preadmission	39	0.7	36	0.7
Inpatient	4,509	76.6	4,005	74.2
Clinic	42	0.7	44	0.8
Follow-up	1,297	22.0	1,312	24.3
TOTAL	5,887		5,397	

It is estimated that for each patient or family member given service, it was necessary for the social worker to make an average of five contacts - consisting of casework interviews, telephone calls, or letters. A full-range of social work services was provided each month for an average of 445 inpatients and 285 of their family members (see Table 2, Column 2). In comparison to last year, the number of inpatients served decreased by 11 percent. The outpatient categories (preadmission, clinic and follow-up) remained at about the same level for this year as last (see preceding Table of patients served).

As discussed in the Staffing section of this report, the department suffered a loss of two full-time professional positions this year and had considerable turnover in personnel. The result is reflected in the 11 percent decrease in the number of inpatients served, a lessened ability to provide as comprehensive a service as would be desirable, and a generally more crisis oriented approach.

Indirect Service to Clients

Table 3 presents a summary of staff time not used in providing direct services to clients but essential to the department's participation in the total treatment program. It does not include an account of the administrative time of either the department chief or assistant chief. Examples of activities involved are attendance at ward rounds, department committees and meetings, team conferences, nursing conferences, professional meetings, and involvement in community programs. A projection for the entire year of the figures presented in Table 3 indicates that the staff spent 4,585 hours in such activities. The figure is about 16 percent less than last year and reflects the fact that the reduced size of our staff made it necessary to reduce its liaison work with the Institutes, decrease its department staff education activities, and practically eliminate research activity.

PATIENT WELFARE FUND

This fund, administered by the department chief, continued to serve a crucial need in providing services and emergency expenses for Clinical Center patients and families which could not be paid out of appropriated government funds. The fund is financed by donations from former patients, family members, friends of patients and NIH employees. For many years, 1953 to 1969, the fund was also supported by regular contributions from the Recreation and Welfare Association out of income derived from its profit on vending machines. The Recreation and Welfare Association discontinued its contributions October 1, 1969. However, it has promised to resume support in the future if the fund cannot raise sufficient money from other sources.

One special source of income is the annual gift from NIH employees at Christmas time under the "Davis Plan" whereby employees are encouraged to donate to the Patient Welfare Fund in lieu of sending Christmas cards to

fellow employees. The Christmas 1970 Davis Fund drive was the most successful in its history and total gifts to the fund were $5,047.18.

During the first 9 months of Fiscal Year 1971, the five principal areas of expenditures from the Patient Welfare Fund and the amounts spent were as follows:

Special programs (unit parties, supplies, etc.)	$ 1,949.89
Patient transportation	1,711.65
Patient miscellaneous expenditures (telephones, clothing, special devices)	3,601.38
Basic necessities (small weekly spending allowance for patients without funds)	1,840.00
Allowances to relatives to assist with living costs while visiting Clinical Center patients	11,540.65
TOTAL amounts spent (July 1970 - March 1971)	$ 20,643.57

Expenditures from the fund have increased rapidly during the past two years (see "Total Withdrawn" Column, Tables 4 and 5). By way of comparison, the total amount spent from the fund was $7,620.44 in the first 9 months of Fiscal Year 1969; $14,750.72 was spent for the same period in Fiscal Year 1970; and $20,643.57 for the first 9 months of this year (see Chart above). The projected total expenditures from the fund for the entire 12 month period of this Fiscal Year is $27,525.76 which will be the highest in its history.

As of March 31, 1971 (see Table 4), the fund had a balance of $20,168.56 as contrasted to $26,550.32 at the same time a year before. The decrease in the fund's balance of nearly $6,500.00 reflects a marked rise in expenditures (i.e., $20,643.57 for the first 9 months of Fiscal Year 1971 as compared to $13,750.72 for the same period in Fiscal Year 1970) and a decrease in income (i.e., $14,506.07 for the first 9 months of Fiscal Year 1971 as compared to $20,171.83 for the same period in Fiscal Year 1970).

Several factors have been responsible for the continued rise in expenditures from the fund. Escalating food costs and the increased cost of renting rooms in nearby homes for family members has made it necessary to give most relatives without funds a larger allowance to live in this area. By agreement with the Clinical Center Executive Office, the fund has markedly increased its support for patient recreational events in the Patient Activities Section. A somewhat increased census this past Fiscal Year has also appeared responsible for generating more requests for direct financial assistance to patients. Reports from the social work staff indicate that generally lower income patients are arriving in more acute financial stress this past couple of years than previously. A final factor responsible for

increased expenditures is that a greatly decreased social work staff simply has had far less time to explore alternative sources of community financial support for hospitalized patients and their relatives.

Despite the general picture of decreased income for the fund and increased expenditures, the current substantial balance of over $20,000 appears ample to make it possible to provide next year for the emergency needs of patients and family members without funds. In making a report of this nature, there is an inherent danger that the financial situation may seem to be overemphasized. Continued solvency of the fund and accountability for expenditues is certainly essential; however, the most meaningful thing to report is that the Patient Welfare Fund assisted over 350 patients and relatives to meet emergency situations at the time when carefully documented inquiries indicated that no other source of help was available.

STAFFING

At the close of the Fiscal Year, the department had 14 full-time and two part-time social workers. Clerical staff consisted of four full-time secretaries or clerk-typists and one part-time clerk-typist. The department's professional positions were assigned as follows: Office of the Chief - 2; Cancer Section - 4; Heart Section - 4; Arthritis and Metabolic Diseases Section - 2 full-time and 1 part-time (4 days a week); and Neurology Section - 2 full-time and 1 part-time (3 days a week).

The department experienced considerable personnel change this year. Among the professional staff, there were four resignations of individuals who had been employed at Clinical Center for periods of 4 to 10 years. Mr. A. R. Polcari, a member of the staff for 9 years, resigned from the Cancer Section in July to accept a position as Executive Secretary for the Center for Suicide Studies, NIMH. Miss Marian Braye, a member of the staff for 4 years, resigned from the Heart Section in August to enroll in a social work doctoral program. Mrs. Belvin R. Blandford, a member of the staff for nearly 10 years, resigned from the Cancer Section in January to move with her husband to a different city. Miss Juanita Todd, a member of the staff for 4 years, resigned from the Cancer Section in February to travel. A fifth resignation occurred when Mrs. Carolyn Clemmons, a part-time case aide for 5 months, employed under the Q Authority, left in October to give full time to her college studies. It was not possible to hire replacements for the first two staff resignations as the department entered the Fiscal Year with two more staff members than the 18 authorized in October 1969 when its full-time position ceiling was reduced. During the year, the department was fortunate in being able to recruit three very competent and experienced social workers. Miss Maxine London joined the Heart Section in December and Mrs. Wilma Scheuren and Mrs. Jeanne Gaver joined the Cancer Section in January and March, respectively. The department had two resignations by clerical staff in September and February and hired two replacements.

The department experienced a most difficult year in attempting to provide needed service with two less social workers than at the close of last year, insufficient secretarial support, the loss of four seasoned professional staff members and the inevitable temporary gaps in ability to provide service while new staff were being oriented to their duties. Staff members presently in the department certainly deserve every recognition for continuing to provide a high quality and quantity of services despite a decrease in manpower and much personnel change. During this period, the responsibilities of the department have actually increased in several areas. For example, the inpatients and outpatient census increased, several new research projects requiring social work involvement were added, and the department chief became project officer for the patient wig contract in January.

STAFF DEVELOPMENT AND PROFESSIONAL ACTIVITIES

As in previous years, coordination of the administrative aspects of the department's work and clinical responsibilities was achieved mainly through the chief's biweekly group meetings with the assistant chief and section chiefs. In addition, individual conferences were held with each section chief each month to review the work of each section. Section chiefs or designated senior social workers provided consultation or supervision for all staff clinical work with patients and families.

Monthly staff meetings were used to keep staff members abreast of administrative matters affecting their work, reports of special projects, and presentation on current practice issues by various speakers. Guest speakers this year discussed a wide range of topics of professional interest including: "Services to Hospitalized Children," "Treatment and Referral Sources for Suicide Patients," "Couple and Family Therapy," and "Social Casework to Patient with Special Disabilities."

The major professional activities of staff members are listed in the appendix. As in previous years, the activities reflect a wide range of professional expertise among the department's staff members and recognition by other professional groups at both a local and national level. These activities were essential both to keeping staff abreast of new ideas and changes elsewhere in practice and in generating understanding by others of our own staff's rather specialized function in a research and treatment center. In addition to serving as speakers and consultants at professional meetings for both social work and other disciplines, several staff members were active in volunteer work for community philanthropic groups and served on boards and committees of local hospitals and social agencies.

The department again enjoyed a good level of support for travel and attendance at professional meetings. One-half of the professional staff attended an out-of-town meeting. Professional meetings attended included the American Association for Child Care in Hospitals, National Conference on Social Welfare, American Orthopsychiatric Association, Council on Social Work Education, American Hospital Association, American Rheumatism

Association, American Society for Hospital Social Work Directors, Cancer Care, Inc., and a wide variety of professional meetings in the local community.

The department sponsored two workshops on topics of special interest. The first, attended by over 20 guests from other departments, was a seven-hour, three-session workshop on the "Hospitalized Child," held on November 4 and 6. Dr. Reginald Lourie, Chief of Psychiatry, Children's Hospital and Hillcrest Children's Center, was the speaker for the first session and discussed approaches to minimizing or preventing psychological trauma for hospitalized children, and methods of making the experience as positive as possible. The second session featured a panel discussion by parents of children hospitalized at the Clinical Center and lead by Mrs. Elizabeth G. Schumann, Clinical Social Worker, Neurology Social Work Section. The third session featured a staff discussion of how the department might be of more assistance to parents of hospitalized children lead by Mrs. Jacqueline Fassett, Director of Social Service, Sinai Hospital, Baltimore, Maryland.

The second workshop was held May 24 on the topic "Advanced Casework for the Experienced Practitioner" with emphasis on case material developed by department staff. The department was most fortunate in obtaining an outstanding teacher as workshop leader, Mrs. Yonata Feldman of the Columbia University School of Social Work and Jewish Board of Guardians.

In September the department achieved a long-standing goal of becoming a field work training agency for students from graduate schools of social work. One student from the National Catholic School of Social Service was supervised this year by Miss Barbara A. Murphy, Assistant Chief. Next year it is hoped that we may be able to accept at least two students and also give other staff members an opportunity to serve as student supervisors. Another student training activity begun this year was the employment of a senior student from Howard University under the Q Authority as a case aide on a part-time basis for a 5 month period.

PRACTICE ORIENTED STUDIES AND PUBLICATIONS

As indicated elsewhere in this report, the decreased size of our staff made it necessary to sharply curtail research activity. Three staff members have continued to give limited attention to formerly established projects: Miss Barbara A. Murphy, Assistant Chief, made arrangements with the Boston College School of Social Work to analyze data previously gathered on the Heart Institute for her project "Does Surgical Success in Children with Heart Disease in the Latency and Adolescent Age Groups Result in Significant Positive Changes in Social Functioning." Mrs. Cleota Bennett, clinical social worker on the Heart Section, who resigned in May 1970, recently submitted the first draft of a paper to the Chief of the Experimental Therapeutic Section, NHLI, on the subject "Evaluation of Hospitalization Expectations of Patients Hospitalized on the Experimental Therapeutics Branch of the Heart and Lung Institute," and Miss Roberta Peay, Chief, Heart Social Work Section, was co-author of an abstract of a study

"Morbidity Analysis of Open Heart Surgical Patients with Correlation to Cardiac Catheterization Data."

Two articles based on research completed in the department were published by present or former staff members. John F. Roatch was co-author with Melitta J. Leff and William E. Bunney, Jr., M.D., NIMH, of the article "Environmental Factors Preceding the Onset of Severe Depressions" published in the August 1970 issue of Psychiatry. An abstract of the article was also written by Mr. Roatch for publication in Psychiatry Digest. Kenneth R. Wedel was author of the article "A Therapeutic Confrontation Approach to Treating Patients with Factitious Illness," published in the April 1971 issue of Social Work.

For several years, Miss Evelyn Walker, Chief, Neurology Social Work Section, has represented the department as a member of a panel of abstractors who write abstracts of professional journal articles of interest to social workers for the quarterly journal, Abstracts for Social Work, a publication of the National Association of Social Work. Currently she is responsible for abstracting articles from The American Journal of Psychiatry and The Journal of Nervous and Mental Diseases.

PROBLEM AREAS

1. The most pressing problem continued to be the lack of sufficient staff. In August, after two years of attrition, the staff was finally reduced from 30 to 18 positions as ordered in 1969. Therefore, the department felt the full impact of its lowered ceiling this Fiscal Year. Despite much experimentation with shortcut approaches to meeting needs for service, it became abundantly clear that it is no longer possible to furnish either the quality or quantity of services once deemed essential. The department continued to meet needs for service by shifting to a more emergency oriented approach on most units, reducing frequency of contact with patients and relatives and sharply decreasing the number of persons contacted initially without referral. One very negative consequence of the reduction of staff was the lessened ability to maintain close working relationships with other disciplines and our general inability to achieve the degree of communication essential to providing maximum care.

2. Ongoing reports from patients and family members involved in the Special Ambulatory Care Program continued to indicate the presence of many social and emotional problems which should be given more attention. For example, several parents commented repeatedly on the sense of loneliness and isolation experienced in relation to their long-time stays away from home and community. Others experienced considerable hardship in financing their stay in the community or returning home during periods when the children were not hospitalized. There was a scattering of complaints about rejection by motel personnel and financial problems related to expenses not covered by SACP.

3. The department's inability to provide sufficient service to the rapidly growing outpatient operation continued to be of concern. As mentioned in previous reports the present system of furnishing social work service to outpatients on a referral only basis is unsatisfactory in that requests from physicians tend to be limited to crisis situations. Ideally, a social worker should be present throughout the time many of the clinics are held.

4. Staff members expressed some growing concern about the apparently uncoordinated gambits into patient therapy which have occurred this past year. For example, the nursing staff at one point developed some kind of study and treatment plan for patients exhibiting special management problems which utilized chaplains and recreational activities staff as therapists; the chaplains developed a couple of therapy groups, and the Clinical Associates on 13 East, with the help of a psychiatrist consultant, developed a group therapy program for leukemia patients which was discontinued after five sessions. The department is pleased that there is evident concern by other disciplines for the need to provide help with emotional problems of patients and families, but concerned that these ventures in therapy were started without multidisciplinary planning.

5. Without the financial support from the R&W Association which formerly amounted to $8,000 per year, it appears that the Patient Welfare Fund will have its lowest income in several years (see Table 6). The estimated income for the Fiscal Year is about $16,000 and expenditures will be about $27,000 (see Table 4). At this point, we are fortunate in having an adequate balance of $20,000 but it is apparent that this will be exhausted within a couple of years if expenditures continue to exceed income by the same amount as this year. Looking ahead, it is essential that every effort be made to insure that R&W resume its financial support, as promised, if the Patient Welfare Fund balance falls below $8,000.

FUTURE OBJECTIVES

1. As indicated last year, restoration of the 12 positions removed from the department's authorized ceiling in 1969 is needed. Although this will probably not be feasible for several years, nevertheless, it is essential if the department is to carry out satisfactorily the full range of responsibilities presently assigned.

2. As indicated last year, it is critical that one professional staff member be added to the Cancer Social Work Section which appears to have the greatest need for an increase in manpower beyond the four professional workers now allotted under the reduced position ceiling. Cancer Institute has the largest patient population, and appears to be adding more areas of additional clinical care than other Institutes.

3. The provision of an interviewing room for the use of social workers working with outpatients. The increasing size of the outpatient operation has resulted in an almost continuous reservation of all interviewing and examining rooms by medical staff making it almost impossible for the social work staff to schedule an office for needed privacy in interviewing.

4. Expansion of the program initiated this year for providing field training experience to graduate students in local schools of social work. Next year, it would be desirable to increase the number of students from the present one to two. Eventually the department could train about four per year.

5. As it does not appear that the department will be granted an increase in its staff sufficient to insure the provision of adequate secretarial support, it is essential that changes be introduced in the present recording system which will make it feasible for staff to render some regular accounting of professional activity. The department is currently experimenting with the introduction of a brief recording form and the possibility of handwritten records.

6. Continued evaluation of the department's methods and responsibilities for providing needed services to patients and their families at a time when the number of patients is increasing and the size of the department has been sharply reduced is also needed.

REPORTS FROM DEPARTMENT SECTIONS

Medical and hospital care which regards illness as only an impairment of physical and biological functioning with disregard to the significance of the social and emotional components is inadequate. A recent statement of the American Hospital Association makes it clear that a hospital has a definite responsibility to provide care that meets the psycosocial needs of patients and families, and recognizes that negative psychosocial factors in illness can delay recovery and in extreme cases can destroy the patient's ability to survive.[1] Implementation of a treatment program which insures maximum attention to the psychosocial component of illness requires that all hospital personnel share this responsibility. Social work, as a profession, with a major commitment to maximizing the social functioning of individuals, has a special charge for both emphasizing psychosocial care as the core of its day-to-day work with patients and families, and promoting an understanding by other disciplines of the social, emotional and cultural factors which impede or enhance the patient's participation in medical care.

Selected highlights of clinical social work in the four sections (Cancer, Heart and Lung, Arthritis and Metabolic Diseases/Allergy and Infectious Diseases, Neurology/Eye) are presented as examples of the social work contribution toward strengthening psychosocial care.

1. American Hospital Association, "The Hospital's Responsibility for the Psychosocial Aspects of Health Care," Pamphlet S59, 1970.

Services to Adult Patients and Families with Limited Life Expectancies

On the Adult Leukemia Service, NCI, one of the primary social work responsibilities is to provide individualized casework service to those patients with limited life expectancy. These patients are generally teenagers or young adults. The natural course of this disease provides three critical phases: initial diagnosis, treatment, and eventually death.

In the first stage, that of the initial diagnosis, patients and families are shocked and disbelieving. They have little understanding of what is to be faced in the process of carrying through with medical care, of the extensive changes which will occur in their own ability to function, and changes in their relationships to family, friends, and employers, affecting the entire fabric of their social life. Here the social worker reinforces the patients and families own efforts to cope; arranging for environmental resources may be an important adjunct. Time is permitted for patients and families to integrate knowledge about the illness, its implications and treatment, encouraging questions and giving information to increase their cognitive ability to handle the reality. Patients and families are helped to become major allies and participants in the total treatment endeavor.

The second phase, that of medical treatment, may be very brief if death occurs, or cover an extended period of time with remissions permitting outpatient care. Vast physical changes and assaults frequently occur during this period which may involve loss of hair, weight loss, Cushingnoid appearance, loss of muscle tone, bone pain, and neurological changes. Patients become aware of "loss of future" and they are faced with feelings of lowered self-esteem, changes in body image, loneliness, feelings of isolation and alienation, depression and despair. It is during this phase that patients become highly sensitized to the reactions of their family and friends, and the social worker may have a significant role in helping family members deal with their own anxieties and fears. In general, the social work goal is to help these patients participate in as many of their normal activities as possible within their physical limitations, and to build upon any strengths whereby they can achieve satisfaction in living in the "here-and-now." Autonomy and independence are encouraged, and continual efforts are made towards the reaffirmation of the patient's own worth. Theye are usually many mood swings and affective changes related to the medical situation and the social worker attempts to minimize feelings of anxiety, loneliness, guilt and despair. Meaningful communication with family members is encouraged and the social worker promotes patient's socialization with peers and others to enhance a feeling of group-belongingness. When patients feel relatively well, they sometimes discuss the effect of their death on others; for example, what to tell the children, wills, legal problems and funeral arrangements.

The third phase, that of approaching death, is always fraught with fear, anxiety, feelings of loss, despair and helplessness. In our experience, few patients accept the thought of death and cling to life tenaciously.

The worker's efforts are towards keeping communication open with patients and families, seeing patients regularly during this period to minimize their sense-of-aloneness, and to help the family with their anticipatory grief and mourning.

Advocacy Role with Patients and Families

If advocacy is thought of within the context of interceding on behalf of patients and families, it becomes clear that this is an important area of service on all department sections. The social work advocacy role is carried out both in relation to the hospital system and to the community. For instance, the social worker on the Surgical Neurology Section in work with patients having severe communication, behavorial and mobility deficits, found that many were too timid, inhibited, frightened or disorganized to act in their own behalf. Consequently, many were unable to discuss their concerns with physicians,ask for help from nurses, or request referral to other Clinical Center programs such as the Patient Activities Section.

In her daily work with patients, the social worker made a point of encouraging expression of these concerns and conveying to the patients and relatives the hospital's positive acceptance of their rights. Bolstered by the worker's support, some patients and families were enabled to go directly to hospital staff with their requests. In other instances, it was the worker who took initiative in alerting staff about the problems.

The advocacy or ombudsman role is particularly important on the Heart and Lung Section's fast moving Cardiology and Surgical Services. Because of the frequent lack of timely communication between the medical and surgical physicians, patients and families receive mixed messages about treatment plans. Surgical schedules for operations are frequently changed. Often information given around the time of discharge is left on a tentative basis sometimes followed by abrupt discharge with little time for necessary planning. Patients and families are sometimes left waiting for medical/ surgical decisions as to whether a patient is to remain for surgery or go home and return for surgery. This somewhat fragmented planning increases the anxiety of patients and families and interferes with their ability to participate in treatment. The social worker is frequently the spokesman for the families and patient, and interprets to physicians and other disciplines how the above outlined uncertainty complicates the ability of all involved to plan for treatment. The social worker's concern is to insure that treatment planning takes into consideration not only the convenience of the hospital and its personnel but also includes accommodation to the patient's social situation.

Advocacy is particularly essential in work with community agencies and resources on behalf of patients and families. The number of agencies and referrals is not routinely kept by our department; however, some indication of the scope of this activity is indicated by the report of the Surgical Neurology Branch which used 65 community agencies on behalf of 54 patients served last year. The typical fragmentation of services provided by agencies makes it difficult for most people to know where to turn for help. Agency personnel often require extensive interpretation of illness in order

to provide the specific assistance required. Misunderstandings about certain diseases and prejudices may result in agency rejection of some of the patients we serve. Two examples of advocacy are listed below to illustrate the kinds of social work activity involved.

It was important to a lone 25-year old young man with Xeroderma Pigmentosa, hospitalized here for 2 years on the NCI Dermatology Branch, that he be accompanied by the social worker for his court appearance where he had to appear following his arrest for attempted burglary. He was subsequently tried, sentenced, and placed on two years' probation. The dimension of advocacy has therefore been extended since the social worker is now collaborating with the probabion officer in the patient's supervision.

Even more critical was the situation of an acutely ill leukemic child of divorced parents, whose legal custody had been given to the mother although she had voluntarily released her three children to the father two and one-half years ago. Based on the mother's religious beliefs as a Jehovah's Witness, she would not consent for "transfusions of blood or blood products." It was our physician's opinion that blood transfusions were necessary for the preservation of the patient's life, and timing was of the essence. The worker initiated the involved procedure for having the Circuit Court of Montgomery County enter an order awarding custody to the father so that he could give consent for the needed transfusion.

Stress Related to Research Protocols and Treatment

Many of the research protocols and medical treatments are stress-inducing and the frequent "unknowns" of outcome in a clinical research setting is anxiety-provoking for patients and their families. NIAMD's triple blind Cytoxan®/placebo/Aziothyaprine® study in the treatment of systemic lupus erythematosis with renal disease involves a format comprising a two-week observation period, renal biopsy, and ten weeks of treatment, requiring a minimum three-month hospitalization. The patient population is composed of adolescents and young adults, mostly female. These young people, coming from all over the United States, have been separated from family, friends, their own physicians, and from the mainstream of their school, job, or home activity. Generally, except for periods of lupus flare, they feel well. Social work provided an opportunity for patients to initially discuss their fears and anxieties about their illness and to consider the pros and cons of actually participating in the study. Because of the extensive block of time required and some of the traumatic side effects of the drug, including loss of hair, all were apprehensive about making a commitment to the study. Careful explanation and continued reiteration of the study goals were necessary in justifying to them the extensive time they would have to remain here. During the treatment course, varied problems pertaining to interpersonal relationships, employment, school, economic circumstances, and life goals were considered in order to help patients. Available family members were also seen to assure that they were abreast of the patient's medical situation and to facilitate any services required to maintain equilibrium within the family unit.

Patients and families on the Special Ambulatory Care Program are not only coping with the impact of their illness, but isolation from their familiar social groups and home community reinforces feelings of loneliness, despair, helplessness, and loss of self-esteem. On the children's Leukemia Service special provisions have been instituted to provide for patients' mothers, who at home are not generally with their youngsters 24 hours a day, more normalized on-going experiences. Mothers are now included in the weekly field trips for patients. Parents are also encouraged to attend the Sunday School for children of all faiths. Both mothers and fathers, when available, attend the weekly Parents' Meetings led by the pediatrician and the social worker. The worker recently arranged with the Montgomery County YWCA to schedule activities for mothers in the 2-East Solarium one afternoon a week. The mothers have welcomed this enthusiastically and these activities have served to channel their energies in more positive and constructive directions. Special arrangements were made with the Patient Activities Section for the mothers to take two arts and crafts projects a week to the motel, thereby providing some evening activity and diversion.

SACP patients, living in local motels, frequently have to be readmitted to the Clinical Center. When this occurs, it is necessary for the parent or spouse, who has been living with the patient, to make other living arrangements. The social worker is frequently called upon to discuss the fear and anxiety in the family member generated by the exacerbation in the patient's illness, and much practical assistance in locating less expensive accommodations, sometimes requiring financial help from the Patient Welfare Fund.

Differential Methods for Alleviation of Long-Term Stress

A group of long-term patients, young adults with a history of lifelong illness, or illness which had its onset in early childhood, received extensive social work services. Most of these young people had not had the opportunity to establish themselves vocationally and were ill-prepared to enter the job market. Normal development away from dependency on family or hospital was blocked because of illness. For these patients the goal of casework endeavor was necessarily a long-range one with many intervening steps. Some of the long-range goals involved helping the patient to establish his individuality, achieve an appropriate dependence/independence balance, build mutual affectional bonds with a person of the opposite sex, relate as an adult to peer codes and social values, choose and develop skills for an occupation, and accept and incorporate the restrictions of society.

Although it may be years before the eventual aim of reducing maturational lag, easing deep feelings of worthlessness and failure and equipping the patient with skills for living is reached, a first step is to help the patient use the hospital setting as creatively as possible. Various avenues are open, based on a meaningful relationship with the social worker. Patients' relationships with other staff members as parent surrogates or role models are maximized. Peer group participation is encouraged, an extension of which might also include groups outside of the hospital. There is discussion of the practical issues of daily living such as

management of money, learning how to conduct oneself in an employment interview, aspects of dress and its effect upon other people. Vocational testing may be appropriate, followed by work experience here at the hospital to identify strengths and weaknesses in performance. Patients' misconceptions about their illness and how these relate to job opportunities are explored. Work outside the Clinical Center is encouraged when feasible. Help is given with decision-making, supporting as much independence as possible. Any channels for the patient to experience gratification and achievement are encouraged. If family attitudes are destructive or hindering patients achieving more maturity, the social worker may become involved in trying to help parents or others modify their approach.

Children, teenagers, and adults admitted to the Eye Section have become legally blind, have seriously impaired vision, or possess a potential for severe visual loss. These patients have been and are under severe stress. Long periods of hospitalization and separation from family create additional frustration and anxiety, compounding the engendered disruption of their lives and the need to come to grips with an uncertain or unfavorable prognosis for their vision. The social worker deals with these problems on an individual basis, but in addition has developed ongoing, bi-weekly multidisciplinary conferences in which nursing staff, occupational therapist, teacher, patient activity counselor, chaplain and worker meet together to review patient's adaptive behavior and adjustment, and plan a coordinated comprehensive approach.

Individual social work focus with teenagers and young adult hemophiliac patients admitted to NIAMD Section is to help the patients free themselves from preoccupation with their disease, to see themselves as persons capable of achieving some gratification in life, to foster independence and promote their capacity for making significant interpersonal relationships to counteract early passive-dependency and isolation frequently resulting from parental efforts to safeguard them as children.

Four years ago, a social worker and a physician started a series of monthly group meetings with hospitalized hemophiliac patients for the purpose of exchanging ideas and feelings with their peer group, of providing an opportunity to discuss their aspirations, and for sorting out misconceptions related to the illness. In general, the group members gained an increased ability to share feelings and experienced more satisfaction in daily living.

This year, the same hemophiliac group met several times with longer intervals between meetings. These young people seem to be functioning well in their school or employment fields, and in most instances their adjustments have been adequate and rewarding. Two people married, another became engaged, two entered college, and the younger members all continued in school. It is thought that this series of sessions over a four-year period has served its function, that of sharing medical information, and sharing psychosocial problems inherent in the illness, with a goal not only towards empathetic understanding, but towards a sharing of solutions gleaned from each other's experiences.

STAFF PROFESSIONAL ACTIVITIES

Mrs. Libby E. Ely

Presented monthly orientation lectures on social work to new nursing staff at Clinical Center, NIH.

Mrs. Kathryn K. Himmelsbach

Member, Inter-Agency Services Conference
The Health and Welfare Council, Washington, D.C.

Member, Committee on Legal Rights for Children
The Health and Welfare Council, Washington, D.C.

Keyman, National Association of Social Workers
Washington Metropolitan Chapter.

Social Work Department Liaison with Clinical Center Red Cross Volunteers.

Panelist in a meeting "The Terminally Ill Patient," sponsored by D.C. Nurses' Association, Washington, D.C., October 1970.

Panelist for an Institute on "Death and Dying," at Providence Hospital, Washington, D.C., December 1970.

Panelist in Conference on Rehabilitation of the Cancer Patient "Team Approach to Rehabilitation," sponsored by The American Cancer Society, D.C. Chapter, Rosslyn, Virginia, April 1971.

Mrs. Lucia N. Mason

Chairman, Sociology Department, Member of the Board of Directors and of Publicity Committee, Washington Saturday College.

Miss Marjorie E. McKinney

Elected to membership in Academy of Certified Social Workers (ACSW) October 1970.

Miss Barbara A. Murphy

Project Consultant, Boston College Social Work School. Discussion of research project "Does Surgical Success in Children with Heart Disease in the Adolescent and Latency Age Group Result in Significant Positive Changes in Social Functioning," Boston, Massachusetts, February 1971.

Field Work Instructor, School of Social Work, The Catholic University of America, Washington, D.C.

Miss Linda E. Nee

Executive Committee, Medical and Health Services Council, Washington Chapter, National Association of Social Workers.

Chairman, "Committee for Medical Services For Families," Medical and Health Services Council, Washington Chapter, National Association of Social Workers.

Social Work Coordinator, Anacostia Center for Medical Services, Washington, D.C.

Presented monthly orientation lectures on social work to new nursing staff at Clinical Center, NIH.

Mr. John F. Roatch

Chairman, The Metropolitan Washington, D.C. Chapter of the Society for Hospital Social Work Directors.

NIH Bureau Representative for the Evaluation, Selection and Placement of Applicants for Appointment in the Commissioned Corps.

Member, DHEW Grievance Review Officer Panel.

Member, Executive Committee, Council on Social Work in Medical and Health Services, Metropolitan Washington Chapter, National Association of Social Workers.

Miss Evelyn Walker

Member, Women's Board, Columbia Hospital, Washington, D.C.

Member, Board of Directors, Homemaker Service of Metropolitan Area, Washington, D.C.

Member, Abstract Committee, National Association of Social Workers.

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Social Work Department
The Clinical Center
Bethesda, Maryland 20014

PHS-NIH
Individual Project Report
July 1, 1970 through June 30, 1971

Project Title: Does Surgical Success in Children with Heart Disease in the Latency and Adolescent Age Groups Result in Significant Positive Changes in Social Functioning

Previous Serial Number: None

Principal Investigator: Barbara A. Murphy

Other Investigators : None

Cooperating Units : Clinical social workers assigned to Cardiology Branch, NHLI

Man Years

Total	:	44 Hours
Professional	:	40 Hours
Other	:	4 Hours

Project Description: Objectives - The purpose of this study is to learn whether children who have been physically improved by cardiac surgery experience concomitant changes in social functioning as measured by their ability to perform age-appropriate tasks before and after surgery.

The project will study the functioning of two groups of children: (1) those in latency period (6 through 10 years); and (2) those in the adolescent period (14 through 17 years), who were admitted to the Clinical Center by the National Heart and Lung Institute.

Data collection was initiated in January 1965, and terminated in January 1970. Of the total number of children interviewed (107) there were 67 of latency age and 40 adolescents. Criteria were developed for age appropriate behaviors in latency and adolescence to be used as a baseline for arriving at judgments on a rating scale.

Method - The developmental theories of Freud, Erikson, Josselyn, and Lidz have been used as a frame of reference for determining the significant life tasks of childhood. The theoretical developmental tasks have been

Does Surgical Success in Children with Heart Disease in the Latency and Adolescent Age Groups Result in Significant Positive Changes in Social Functioning

translated into a series of perceivable behaviors. From these a schedule has been devised, containing a series of questions concerning life tasks as they relate to latency and adolescence.

The children were used as the primary source of data. The schedule was administered in an interview situation at two different points of time--before surgery, and following a medically appropriate period after surgery. A supplementary schedule for the available parent was also administered in an interview situation at two different points in time--prior to and following surgery.

Schedules to provide medical information related to (1) the patient's functional capacity preoperatively and postoperatively; (2) whether corrective or palliative surgery was performed; and (3) the surgeon's judgment as to those patients whose cardiac status was improved.

Proposed Course - The social work students, under the direction of the research director at Boston College, School of Social Work, Boston, Massachusetts, are developing a model and undertaking a content analysis of the data to determine how many of these patients with congenital heart defects and acquired heart disease are functioning within age appropriate developmental levels as seen by their task performance as opposed to those who have psychosocial developmental deficits.

TABLE 1
INPATIENT COVERAGE BY PERCENTAGE SERVED EACH MONTH
JULY 1970 through MARCH 1971

INSTITUTE	TOTAL IN-PATIENTS CENSUS	IN-PATIENTS SERVED	PERCENT COVERAGE
NCI	1,839	1,298	70.6
NHLI	1,385	1,162	83.9
NIAID	499	275	55.1
NIAID	561	521	92.9
NINDS	935	749	80.1
TOTAL	5,219	4,005	76.7

TABLE 2
NUMBER OF CLIENTS PROVIDED WITH SOCIAL WORK SERVICES
JULY 1970 through MARCH 1971

SOCIAL WORK SECTION	PREADMISSION (1)		INPATIENT (2)		CLINIC (3)		FOLLOW-UP (4)		TOTAL CC PATIENTS	TOTAL FAMILY MEMBER
	CC PATIENT	FAMILY MEMBER	CC PATIENT	FAMILY MEMBER	CC PATIENT	FAMILY MEMBER	CC PATIENT	FAMILY MEMBER		
JULY	6		467		5		145		623	
		3		329		1		77		410
AUG.	5		471		4		165		645	
		3		349		1		80		433
SEPT.	4		483		4		171		662	
		2		304		3		77		386
OCT.	3		476		9		155		643	
		0		276		3		69		348
NOV.	7		431		4		150		592	
		2		271		1		55		329
DEC.	3		406		4		146		559	
		4		270		4		60		338
JAN.	4		417		6		153		580	
		1		263		2		56		322
FEB.	2		399		3		126		530	
		1		234		0		84		319
MAR.	2		455		5		101		563	
		3		269		1		61		334
TOTAL	36		4,005		44		1,312		5,397	
		19		2,565		16		619		3,219

(1) PREADMISSION - Service between acceptance for project and admission.

(2) INPATIENT - Person occupying a Clinical Center bed at anytime during the month.

(3) CLINIC - Service where patient has never been an inpatient.

(4) FOLLOW-UP - Service to former inpatient.

TABLE 3
GROUP ACTIVITY REPORT
FOR FIRST 9 MONTHS OF FISCAL YEAR
JULY 1970 through MARCH 1971*

SECTION	RESEARCH ACTIVITIES		PRACTICE-PROGRAM ACTIVITIES		SOCIAL WORK DEPARTMENTAL ACTIVITIES		COMMUNITY AND PROFESSIONAL ACTIVITIES		TOTAL HOURS
	HOURS	%	HOURS	%	HOURS	%	HOURS	%	
NCI	0		867	63.0	441	32.0	69	5.0	1,377
NHLI	23	3.4	374	55.6	260	38.6	16	2.4	673
NIAID NIAMD	5	.7	512	76.1	137	20.4	19	2.8	673
NINDS	2	.3	381	53.2	215	30.0	118	16.5	716
TOTAL	30	.9	2,134	62.1	1,053	30.6	222	6.4	3,439

*The total hours projected for 12 months would equal 4,585.

TABLE 4
PATIENT WELFARE FUND EXPENDITURES
JULY 1970 through MARCH 1971*

MONTH	SPECIAL PROGRAMS	PATIENT TRANSPORTATION	ALLOWANCE TO RELATIVES	PATIENT MISCELLANEOUS	BASIC NECESSITIES	TOTAL WITHDRAWN	TOTAL DEPOSITS
1970 JULY	$ 230.50	$ 92.00	$ 1,443.55	$ 208.55	$ 141.00	$ 2,115.60	$ 1,068.34
AUGUST	566.85	191.00	1,104.45	344.50	158.00	2,364.80	734.50
SEPTEMBER	379.75	180.85	1,191.50	554.10	195.00	2,501.20	1,381.17
OCTOBER	80.04	224.20	1,028.75	285.01	160.00	1,778.00	1,097.75
NOVEMBER	108.50	188.35	904.00	557.64	163.00	1,921.49	1,203.66
DECEMBER	181.95	275.90	1,526.40	473.24	228.00	2,685.49	5,008.32
1971 JANUARY	159.25	133.00	1,682.00	458.98	217.00	2,650.23	2,086.15
FEBRUARY	107.50	122.20	1,308.00	371.55	275.00	2,184.25	1,604.18
MARCH	135.55	304.15	1,352.00	347.81	303.00	2,442.51	322.00
APRIL							
MAY							
JUNE							
TOTAL	$ 1,949.89	$ 1,711.65	$11,540.65	$ 3,601.38	$ 1,840.00	$20,643.57	$ 14,506.07

RECAPITULATION

Balance brought forward July 1, 1970		$ 26,306.06
*Fiscal Year 1971	- Deposits	14,506.07
		$ 40,812.13
*Fiscal Year 1971	- Withdrawals	20,643.57
	TOTAL	$ 20,168.56

TABLE 5
PATIENT WELFARE FUND EXPENDITURES
JULY 1969 through JUNE 1970

MONTH	SPECIAL PROGRAMS	PATIENT TRANSPORTATION	ALLOWANCE TO RELATIVES	PATIENT MISCELLANEOUS	BASIC NECESSITIES	TOTAL WITHDRAWN	TOTAL DEPOSITS
1969 JULY	$ 35.00	$ 70.00	$ 832.00	$ 146.30	$ 182.00	$ 1,265.30	$ 506.80
AUGUST	30.00	188.86	807.70	155.26	123.00	1,304.82	2,489.40
SEPTEMBER	42.56	126.40	884.00	257.73	154.00	1,464.69	354.15
OCTOBER	25.00	52.20	516.00	289.23	157.50	1,039.93	4,620.43
NOVEMBER	22.00	36.25	354.00	267.15	138.00	817.40	853.03
DECEMBER	95.00	122.95	1,115.00	240.96	124.50	1,698.41	3,951.09
1970 JANUARY	51.00	72.50	1,460.00	226.39	131.75	1,941.64	2,779.38
FEBRUARY	40.00	60.35	748.00	207.59	100.00	1,155.94	1,610.00
MARCH	84.75	124.30	2,321.70	320.24	198.50	3,049.49	3,007.55
APRIL	109.25	33.00	1,215.40	293.08	121.00	1,771.73	2,497.66
MAY	132.62	58.75	1,165.00	264.81	118.00	1,739.18	723.70
JUNE	84.50	71.25	1,049.16	367.59	122.00	1,694.50	1,726.69
TOTAL	$ 751.68	$1,016.81	$12,467.96	$ 3,036.33	$ 1,670.25	$ 18,943.03	$ 25,119.88

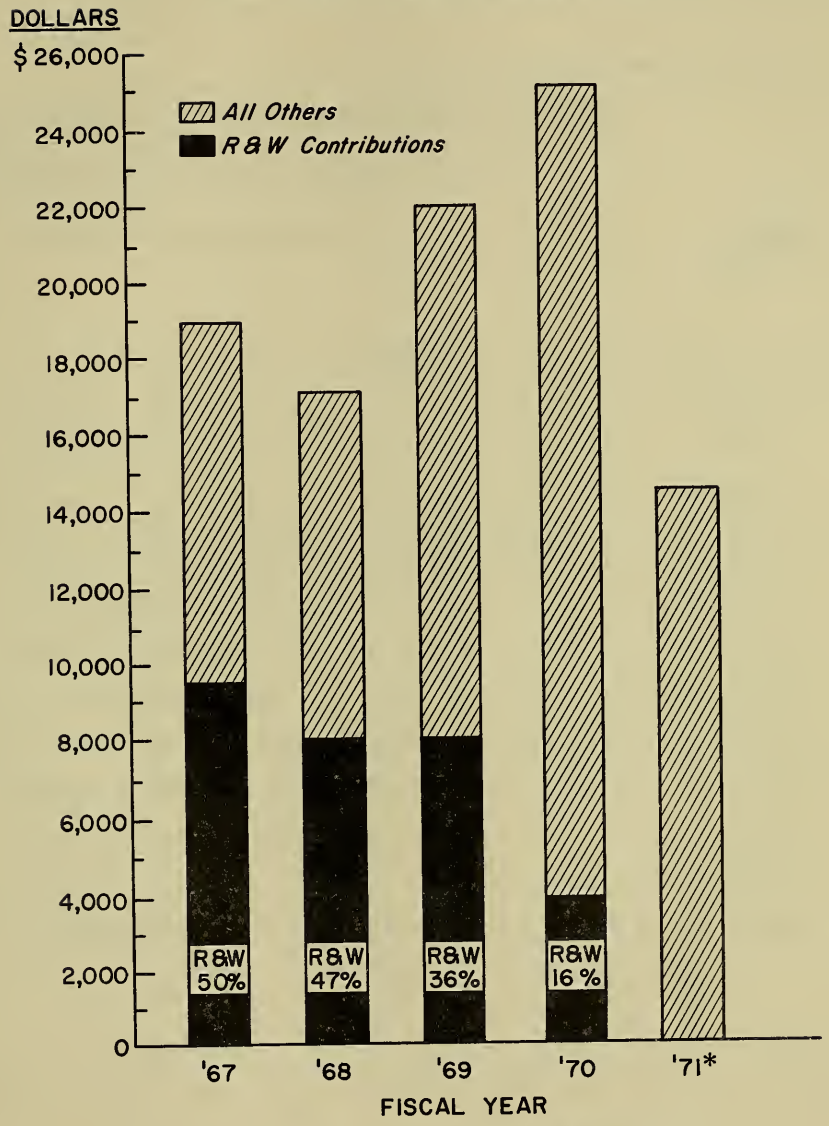
SW-24

RECAPITULATION

Balance brought forward July 1, 1969		$ 20,129.21
Fiscal Year 1970	- Deposits	25,119.88
		$ 45,249.09
Fiscal Year 1970	- Withdrawals	18,943.03
	TOTAL	$ 26,306.06

TABLE 6

PATIENT WELFARE FUND INCOME
COMPARISON OF R&W CONTRIBUTIONS TO
ALL OTHER CONTRIBUTIONS FY '67-'71



*Amount of contribution is only for the first nine months of FY.
No contributions were made by R & W this FY.

July 1970 - March 1971

July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

DEPARTMENT OF SPIRITUAL MINISTRY

CC-40
Serial No.

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July 1, 1970, through June 30, 1971

PUBLIC HEALTH SERVICE, NATIONAL INSTITUTES OF HEALTH

SUMMARY ANNUAL REPORT OF PROGRAM ACTIVITIES
CLINICAL CENTER

DEPARTMENT OF SPIRITUAL MINISTRY

CC-40
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OVERVIEW

The basic task of the department was to provide a spiritual ministry to patients and their families who welcomed the ministration of a clergyman and to hold religious services in the hospital. It also included acting as a liaison with religious groups not represented by the staff chaplains and conducting training programs and research in hospital ministry.

Members of the staff remained the same as last year: Chaplains Kerney, Robey and White, Father Guicheteau, and Rabbi Kleinberg. After a very serious illness we welcomed back Father Guicheteau as he assumed again his duties in the Clinical Center. Among a number of priests who assisted in carrying out the ministry to Catholic patients, Fr. John Blandin, S.J., carried the major load.

The staff of the department was again augmented by five Army chaplains enrolled in a year's program of clinical pastoral education beginning in September 1970. These men, Chaplains Allen, Hanson, Polhemus, Tolbert, and Father Capitani, were assigned to the Clinical Center for this study program as a part of their career development. The professional experience and the personal maturity that these five men contributed added greatly to the total program of the department.

Chaplain Kerney served as President of the College of Chaplains, a division of the American Protestant Hospital Association. He will serve as Past President for the organization in 1971. Chaplain Robey was active in the work of the Association for Clinical Pastoral Education, Inc., and the Commission on Chaplains and Related Ministries of the United Methodist Church. Chaplains White, Kleinberg, and Father Guicheteau were also involved with their ecclesiastical and professional groups.

Two discussion groups were organized again this year to give patients and their relatives an opportunity to discuss their "faith" as it relates to their illness. Questions and discussion emerged that are muted in other

groups or relationships with other professional people. There is much to commend a continuation and expansion of this form of inter-faith ministry.

A quick study on admissions to the Clinical Center suggested the following gross breakdown of religious preference of patients:

Protestant: 70 percent
Roman Catholic: 23 percent
Jewish: 6 percent

Protestant, in this case, was a very general category and was viewed in the negative as being neither Catholic nor Jewish.

CHAPEL SERVICE

Regular Chapel Services were held during the year by the various chaplains. These services were:

Protestant: Sunday, 10:00 a.m. Holy Communion Service, the first Sunday of each month.

Catholic: Sunday, 7:15 a.m. and 8:30 a.m.; weekdays, 11:15 a.m. Daily distribution of Communion to bedridden patients.

Jewish: Friday, 4:00 p.m., and Saturday, 9:30 a.m.

In addition to these regular services, special services were also held, including:

Protestant: World Wide Communion--1st Sunday in October
Thanksgiving Day Service
Christmas Carol Service
Good Friday Service

Catholic: Holy Days of Obligation--two masses
Daily Rosary Services--during October and May
Special Blessing of Throats--February 3
Stations of the Cross--Fridays during Lent
Distribution of Ashes (Ash Wednesday)

Jewish: Rosh Hashanah Sukkoth Purim Shavuoth
Yom Kippur Chanukah Passover

The new Catholic altar was completed. It is in the modern style; the altar itself is elliptical, so that the priest can stand behind it and yet it can revolve. The symbolism is a modern version of ancient designs. The Catholic altar was used for the Protestant Good Friday Service to which

Catholic patients were invited to attend. The Catholic altar was also used for the Protestant Easter Service as an outward sign of common beliefs and devotion.

The Interfaith Sunday School continued on the 2-East nursing unit with a positive response by staff, parents, and patients. The sessions emphasized aspects of religion shared by all, with attention also given to the heritage and tradition of each child that could be shared with the group. Attendance varied from three to eight children each Sunday, with most youngsters falling in the 3-9 year age bracket. Written permission to attend was secured from the parent(s) of each child.

The response by the children, parents, and staff to this activity was excellent. Parents felt that something was being done for their children in this area. The staff was most cooperative in helping to get the children ready for the sessions. The chaplains found increased rapport with the children and their parents.

Daily mass, scheduled at 11:15 a.m., was attended regularly by 10 to 20 persons, with up to 30 persons attending daily during Lent. The opportunity to attend mass in the chapel was deeply appreciated by patients and their relatives, particularly at critical times during their hospital stay. Services were broadcast over bedside radios for patients who were not able to be present in the chapel. A short sermon was preached daily.

Holy Communion was distributed to Catholic bed patients each day, starting at 10:15 a.m. About 25 to 39 bed patients received daily, in addition to those who received Holy Communion at the daily mass. Confessions were heard daily before mass. The Sacrament of the Anointing of the Sick was given frequently. Formerly many had the false idea that this sacrament was only for the dying. That false idea is now disappearing. When this sacrament is given, it is noted on the patient's admission sheet and Kardex. At various times Father Guicheteau announced that this sacrament was available to any of the sick in the hospital. The first person who asked for it was from Mental Health. This startled him for a moment and he asked himself, "Is this person really sick?" Of course, he answered in the affirmative and administered the sacrament.

When the various religious services were explained to the new patients, in a number of cases the response was: "Oh, that is wonderful. The only reason I did not wish to come here was that I thought there would be few religious opportunities."

In the case of patients who die and are within a reasonable distance, the chaplain visits the funeral home, usually to the great consolation of near relatives, as was shown by the way he was welcomed. In any case, a note was sent to the bereaved, usually a mass card, indicating that a mass was to be said for the deceased. A number of grateful letters were received in return, indicating that this was of much consolation.

Frequently it was found helpful to visit in the evening for the sake of relatives of the seriously ill, or of those who had just been operated on. When they decided to remain the whole night, they seemed especially to appreciate talking with the chaplain.

Sister Mooney, from Stone Ridge Convent, continued to visit the Catholic patients four days a week as a volunteer. In several cases, women patients revealed their spiritual troubles to her first, and then they were referred to the Catholic chaplain.

The chaplain was almost universally welcomed, particularly by religious patients who saw in him a familiar figure in the midst of a strange environment. "Come back and talk with me some more," were familiar words heard on his departure.

Booklets of prayers suitable for the sick were distributed to those who wanted to receive them.

Passover seder (symbolic) meal was conducted for Jewish patients. Patients who could not leave the hospital expressed their appreciation for the concern given to their spiritual needs. Matzoth (unleavened bread) were available upon request during the entire week of Passover.

In addition to the Jewish services previously mentioned, special memorial services (yizkor) were conducted as prescribed by Jewish tradition. These were open to employees of the Clinical Center enabling them to fulfill their religious obligation with a minimum of time away from their duty stations.

Preparation of a pamphlet of prayers for the family, a companion piece to "Prayers for the Sickroom," initiated by Rabbi Kleinberg, is in process of completion.

The Protestant chaplains, including the Army chaplains, took turns conducting the Protestant Chapel Services. This rotation helped patients and their families who came to the chapel to identify and to become acquainted with each of the Protestant chaplains.

A number of patients expressed appreciation for the opportunity to attend a religious service within the hospital building, and for the Sunday morning sermon. Bedside communion was brought to patients who requested it. Two patients were baptized during the year.

GROUP WORK

Several discussion groups were started during the year in order to meet some of the needs of patients through this medium and to give the Army chaplains experience in group work. One of these groups is a Parents' Sharing Group of fathers and mothers of children with leukemia on 2-East. Two groups were also formed of patients with eye diseases and adult leukemia on the 13th floor.

In the Parents' Sharing Group, in an eleven-week period, 19 different people, mostly mothers, participated. Some came for six times, others once or twice. The range of "experience" of the parents ranged from "brand-new" to four and one-half years in treatment. The religious diversity ranged from none through a variety of Protestants, Catholics, to a Greek Orthodox.

It seemed important to the participants to have a place to meet away from their children, to share and talk freely with people going through the same "valley of shadows." There was no attempt to impose on them a set of answers to their concerns. Rather, it was an attempt to offer openness and understanding. In many cases, there was a deliberate refusal to confront participants even when they sounded "crazy."

The concerns of the parents included finding an "explanation" of the "why" of their children's illness and impending death. The group discussed what they thought death was like, what children think, and what parents should and should not tell their children. A common theme was their worry about the unknown and how to prepare themselves. Other themes included theological concepts such as heaven, hell, punishment, and what is the good life.

Many of the same themes emerged in the other groups. This brief experience pointed to the need of patients and their relatives to share with each other and with a representative of the Department of Spiritual Ministry their religious and spiritual concerns. This did not in any way take the place of work by other disciplines. Rather, it indicated that concerns and questions of this nature will not be openly expressed in other relationships both with other disciplines and even in one-to-one relationships with a chaplain.

PASTORAL MINISTRY TO PATIENTS AND THEIR FAMILIES

The heart of the work of the Department of Spiritual Ministry continued to be the ministry to individual patients and their families. Patterns of ministry varied according to the traditions of the major faiths. Pastor, priest, and rabbi, each had his unique approach to meet the spiritual needs of his patients. Methods in ministry also varied according to the ratio of patients to individual chaplains.

The department attempted, when possible, to have a staff member visit all patients prior to major surgery, patients who were on the seriously ill list, and families of patients who died. Using April 1971 as a typical month, there were 54 major surgical operations, 15 seriously ill patients reported, and 9 expirations.

All Catholic patients were contacted through the sacramental ministry of the Catholic chaplain. The Jewish chaplain was able to see all the patients of the Jewish faith. Most of the Protestant patients were visited. Priority was given to the terminally ill, the seriously ill, and those scheduled for surgery. All referrals by staff, relatives, pastors, or self were seen. Clergymen from the community were called upon to minister to special patients,

e.g., patients requesting special rites from a clergyman of their own denominations. These included several Greek Orthodox priests who were routinely called to minister to the Greek-speaking patients on the Heart nursing units.

Pastoral problems which the chaplains encountered included: loneliness, grief, fear, guilt, anxiety, loss of spiritual meaning, boredom, identity crisis, and changes in body-image and body-function. Pastoral methods included pastoral conversations, sacraments, blessings, prayer, scripture, and worship. On occasion, the chaplains were involved in helping patients and their families resolve dilemmas of conscience, conflicts of values, and difficulties in accepting radical therapies.

ILLUSTRATIONS OF PASTORAL MINISTRY

1. "I was called at 11 p.m. to see a young man whose father was near death. The father had undergone heart surgery six months earlier, had not done well, and had returned several times with various complications.
   The patient was in a fatal coma and his son shared with me the sense of loss and anger he had tried to hide earlier by humor and thinly veiled hostility. His father had been retired six years because of his heart condition, his mother was confined to a wheelchair with arthritis. His own marriage was unsatisfactory. Only the relationships with his father and his own young son had any meaning for him.
   The patient and his son were similar in handling their problems by joking and keeping others at a distance. The son professed no religious beliefs and said his father had felt the same. The young man poignantly said: 'I'm losing the only person in the whole world who ever understood me and accepted me even when he didn't agree with me. He never tried to make me feel dumb if I was wrong.' The terrible loneliness of those moments was underscored as he described the poverty of all his other relationships. After moving through this sadness the young man began to focus on his own son and their life together. Then he asked me the hard questions about the autopsy that he knew would be requested, the burial procedures, and how he should handle informing his invalid mother. We talked quietly for more than an hour.
   The patient died at seven the next morning. I was asked to have the funeral. The final wrenching experience was the graveside service in a small and hilly national cemetery during a steady rain, the patient's wife being pushed in her wheelchair up a muddy hill, a long freight train roaring close by during most of the brief service--and then the mournful Taps from a hill above us, the gray day hanging over us like a wet shroud."

2. "After an interval of about a year, his name again appeared on the admission list. I recalled his previous stay at NIH and was surprised to note how his condition had worsened. Afflicted with a progressively deteriorating neuromuscular disease, I found him no longer able to walk, deprived of the use of his arms and barely able to move some of his fingers. If, while propped up in a wheelchair, he should sway to one side he could not straighten up. He had become almost totally helpless. When I entered his room, he burst into tears. Through his convulsive sobs he managed to tell me he had become almost totally crippled. I put my arm around his shoulder, wiped his tears away, and helped him regain his composure. He told me of his past year's struggle with living, that none of the treatments had helped him, and that he just wished he could die and cease to be a burden to everyone. I assured him that in time death would come. He need not be concerned about that, what he must do is learn to cope with his life as it is, one day at a time, and we would try to help him in every way possible. His religious devotion was not dimmed. He had remembered the Hebrew tradition that God did not afflict a person without giving him the strength necessary to cope with it, and that each one was duty-bound to seek that strength. He attended religious devotions regularly. One of the congregants always sat next to his wheelchair and turned pages for him. He was profuse in his thanks and was surprised to learn that his limitation served to provide for this congregant the feeling of being needed and of service. I helped him to realize that in this way he was making a worthy contribution to the lives of many people around him. His mind was keen and he was able to function as an attorney. After some weeks he left NIH and though he realized he could not expect any improvement in his physical state, he was convinced that there was much for him to do with his keen mind. I had even gotten him involved with thinking about the design of some physical aids that might compensate for some of his handicaps. He had gained spiritual and mental stability which hopefully will see him through each new day."

(Later) ". . . I cannot tell you in words how much I found the warmth of your daily visits and your help in wheeling me about, despite the fact that you were the chaplain. I shall never forget you, and want you to know that the many words of comfort during your sermons have stood me steadfast when my spirits have become low."

3. Excerpt from a letter received on 10 March 1971:

> ". . . The last time you saw us at NIH it was August. My dear wife had a new wig, necessitated by the radiation therapy. We conversed with you at length because it was quite evident that from all indications hope was fading. After our talk we were able to face the uncertain future with faith and equanimity. After two short stays at our local hospital she asked to go home. With the help of a wonderful sympathetic and efficient nurse, we were able to keep her comfortable. . . . In spite of the great incursion of her cancer, she remained alert and uncomplaining until she slipped into a merciful coma two days before the end. We both had drawn great comfort from our conversations with you. I shall never forget your concern and prayers for our welfare. . . . God bless you and yours."

PASTORAL TRAINING FOR CLERGY

The pastoral training program in the department was viewed as a complementary activity to the basic function of service to patients. While pursuing educational goals in the training programs, the trainees extended and enriched the service dimension of the total work of the department. The ongoing educational program also enriched the ministry of the staff chaplains of all three faith groups through participation in joint seminars as well as through the stimulation provided by the trainees. It gave the Protestant ministry a wider range of denominational representatives as well as increased continuity of a particular chaplain with the same patient and his family over a period of time. Without such programs, and particularly the men who came for a "clinical year," the quality and quantity of pastoral services would have been reduced.

The second Intern Year program of clinical pastoral education in the Clinical Center concluded on July 31, 1970. At a tea honoring the group, Dr. Thomas C. Chalmers presented certificates to the four Army chaplains and the civilian Roman Catholic priest who had completed the year's program.

The Clinical Center began its third Intern Year program of clinical pastoral education on August 31, 1970. Five Army chaplains were enrolled, one Roman Catholic and four Protestants. The ecumentical composition of the group was a great asset in the education of the chaplains and to the patients served by the Department of Spiritual Ministry. The FY 1971 group of Army chaplains did a superior job with patients and staff. They were able to take initiative to expand the group work of the Department of Spiritual Ministry with patients, and with relatives of patients. Under supervision, they were also used by nurses and physicians as consultants in patient care, especially work with the dying.

Consultation was given by Chaplains Robey and Kerney to interested individuals regarding programs of clinical pastoral education at the Clinical Center, and to clinical pastoral education students seeking informative and/or evaluative interviews. Continuing assistance was given during the year by Chaplains Robey and Kerney to area seminaries by interviewing their students applying for courses in clinical pastoral education. As the program of clinical pastoral education at the Clinical Center became better known nationally, an increasing number of persons sought to apply for a year's study in the Clinical Center. Very few of those interested were able to come as guest workers. In order to select the best qualified candidates for ministry to Clinical Center patients, it became increasingly desirable to have funds available to pay stipends to those participating in the program of clinical pastoral education.

Chaplain Robey served as Regional Chairman, Mid-Atlantic Region, Association for Clinical Pastoral Education, and was elected to the national Certification and Accreditation Committee. Chaplain Kerney was reelected a member of the Historical Committee, and served as a member of the Development Committee of the Mid-Atlantic Region, Association for Clinical Pastoral Education.

WORK WITH STAFF

The Department of Spiritual Ministry participated in orientation programs for nursing personnel and Red Cross Hospital Volunteers. An orientation seminar was held for four new members of the Social Work Department. A number of staff persons lectured, or were members of panels, in the instructional program for the Army chaplains.

Much of the work with staff took place on an informal, routine level when consulting with other staff personnel, exchanging information at the nursing stations, discussing concerns during luncheon periods, occasionally making "rounds" with the staff physicians, and attending clinical conferences.

Chaplain Kerney is serving on the advisory council of the Clinical Center E.E.O. program. Chaplain Eugene Allen worked with the staff of 13-East on a group basis discussing the human and spiritual needs of eye patients and their families. Chaplain Polhemus has worked very closely with staff on 2-East and nurses in the Out-Patient Clinic dealing with leukemic children and their families.

WORK WITH OTHER INSTITUTIONAL CHAPLAINS

As President of the College of Chaplains, a division of the American Protestant Hospital Association, Chaplain Kerney delivered the President's Address to the annual meeting of the College of Chaplains in Denver, March 16. He received a Past-President's placque honoring his service for the last year and will serve in that capacity for the year 1971. He also served on the Board of Trustees of the American Protestant Hospital Association.

Chaplain Kerney served on a Task Force on Institutional Chaplaincy of the Board of National Missions of the United Presbyterian Church of the U.S.A. Chaplain Robey was active on the Commission on Chaplains and Related Ministeries of the United Methodist Church.

As the culmination of the interest and work of lay people through the Council of Churches of Greater Washington, a chaplain was called and installed at the D.C. General Hospital in the District of Columbia. Chaplain Kerney worked with the Committee and was a part of the installation service April 28.

PROFESSIONAL MEETINGS (Chaplaincy)

American Protestant Hospital Association, College of Chaplains
Denver, Colorado--Chaplain Kerney

Executive Committee of the College of Chaplains
Executive Committee of the Board of Trustees of the A.P.H.A.
Board of Trustees of the American Protestant Hospital Association
Chicago, Illinois--Chaplain Kerney

Chaplains Monthly Seminar with Chaplains from National Naval Medical Center and Walter Reed Army Medical Center
Held at Clinical Center, NNMC, and WRAMC
--Chaplains Guicheteau, Kerney, Kleinberg, Robey, White, Allen, Capitani, Hanson, Polhemus, Tolbert

National Association of Catholic Chaplains
Atlantic City, New Jersey--Father Guicheteau

American Association of Marriage and Family Counselors (four meetings)
Washington, D.C.--Chaplain Kleinberg

Certification and Accreditation Committee
Mid-Atlantic Region, Association for Clinical Pastoral Education
Richmond, Virginia--Chaplain Robey

Association for Clinical Pastoral Education
Boston, Massachusetts--Chaplain Kerney, Chaplain Robey

Accreditation Visit to Theological College of Catholic University
Washington, D.C.--Chaplain Robey

Association for Clinical Pastoral Education
Mid-Atlantic Region, Spring Meeting
Baltimore, Maryland--Chaplain Kerney, Chaplain Robey

PROFESSIONAL MEETINGS (Ecclesiastical)

Task Force on Institutional Chaplains
Board of National Missions, The United Presbyterian Church in the U.S.A.
Chicago, Illinois--Chaplain Kerney

The United Presbyterian Church in the U.S.A.
Presbytery of Washington City (six meetings)
Monthly Meeting of the Ministerial Relations Committee
Washington, D.C.--Chaplain Kerney

United Methodist Commission of Chaplains and Related Ministries
(two meetings)
Washington, D.C.--Chaplain Robey

Sessions, West Virginia Annual Conference
The United Methodist Church
Buckhannon, West Virginia--Chaplain Robey

The Presbyterian Church in the U.S.
Presbytery of Potomac (six meetings)
Christian Education Committee (one meeting)
Minister and His Work Committee (three meetings)
Washington, D.C. area--Chaplain White

Task Force on the Mental Health of Ministers
General Assembly of the Presbyterian Church in the U.S.
Regional Convenor (one meeting)
Alexandria, Virginia--Chaplain White

Mid-Atlantic Institute on Christian Education
Study Committee on Home and Family Nurture (one meeting)
Washington, D.C.--Chaplain White

Synod of Virginia
The Presbyterian Church in the U.S.
Annual Meeting
Richmond, Virginia--Chaplain White

Monthly meetings dealing with Modern Religious Problems
Georgetown Preparatory School
Rockville, Maryland--Father Guicheteau

Regional Meeting of the Central Conference of American Rabbis
Williamsburg, Virginia (four meetings)--Chaplain Kleinberg

LECTURES

Georgetown University School of Nursing
Member of a Panel "Spiritual Aspects of Nursing"
Washington, D.C.--Chaplain Kerney

Columbia University, Faculty of Medicine, Department of Psychiatry, The School of Nursing, and the Foundation of Thanatology
Symposium and Workshop on "Psychosocial Aspects of Terminal Care"
Paper - "Pastoral Use of the 'Seven Last Words' in Terminal Care"
New York, New York--Chaplain Kerney

American Cancer Society
Conference on Rehabilitation of the Cancer Patient
Member of a Panel
Washington, D.C.--Chaplain Kerney

Suburban Hospital
A Clergymen's Conference
"Crises Faced by a Patient"
Bethesda, Maryland--Chaplain Kerney

Presbyterial of Potomac Presbytery
Panel Member. "Women's Liberation and the Church"
Alexandria, Virginia--Chaplain White

Council of Churches of Greater Washington
Regency House Project for the Elderly
Bible Study Leader
Washington, D.C.--Chaplain White

Minister and His Work Committee
Presbytery of Potomac
"The Pastoral Care Function of Presbytery"
Alexandria, Virginia--Chaplain White

COMMUNITY CONTACTS

Members of the Department of Spiritual Ministry had numerous contacts with nearby churches, parish clergy, hospital chaplains, visiting doctors, and other professional persons. As a member of the Pastoral Care and Counseling Committee of the Council of Churches of Greater Washington, Chaplain Kerney served on a subcommittee concerned with re-establishing a Protestant chaplain at the D.C. General Hospital.

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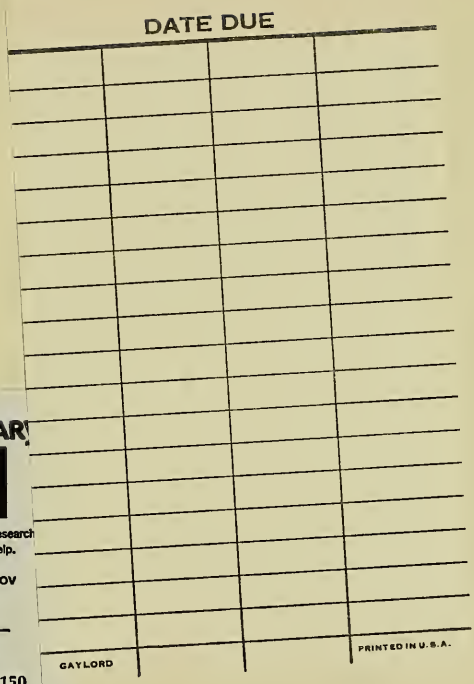

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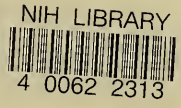

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